

Annual AVMA Meeting

Denver, Colorado

August 14-18, 1960

Journal

OF THE
**AMERICAN VETERINARY
MEDICAL ASSOCIATION**

Concentration of Penicillin in Milk

A STUDY was made of the diffusion of penicillin from blood to milk when given intramuscularly in aqueous and oil preparations. Page 477

Role of Animals in Relation to Human Viral Diseases

A REPORT on the public health significance of the viral diseases transmissible from animals to man. Page 481

Trichomoniasis in Bulls

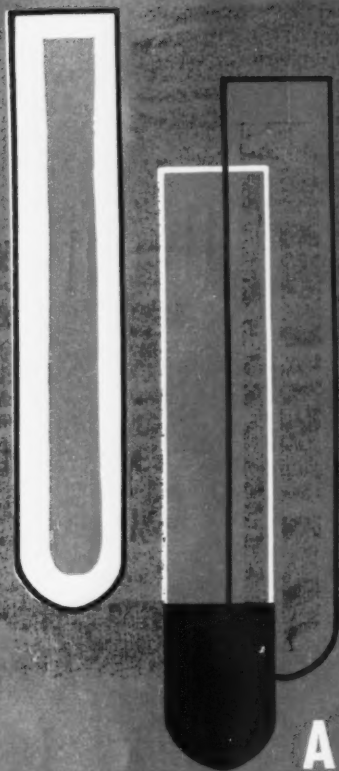
A DISCUSSION of treatment of trichomoniasis in bulls using various drugs and means of application. Page 501

Tapeworms and Lungworms in Sheep

HYGROMYCIN B in the ration was considered an economically justifiable treatment of sheep infected with the fringed tapeworm. Page 505

THE EFFICACY of cyanacetyldrazide for removal of lungworms from naturally infected sheep is evaluated. Page 508





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Journal

OF THE
AMERICAN VETERINARY
MEDICAL ASSOCIATION

Vcl. 136 No. 10 May 15, 1960

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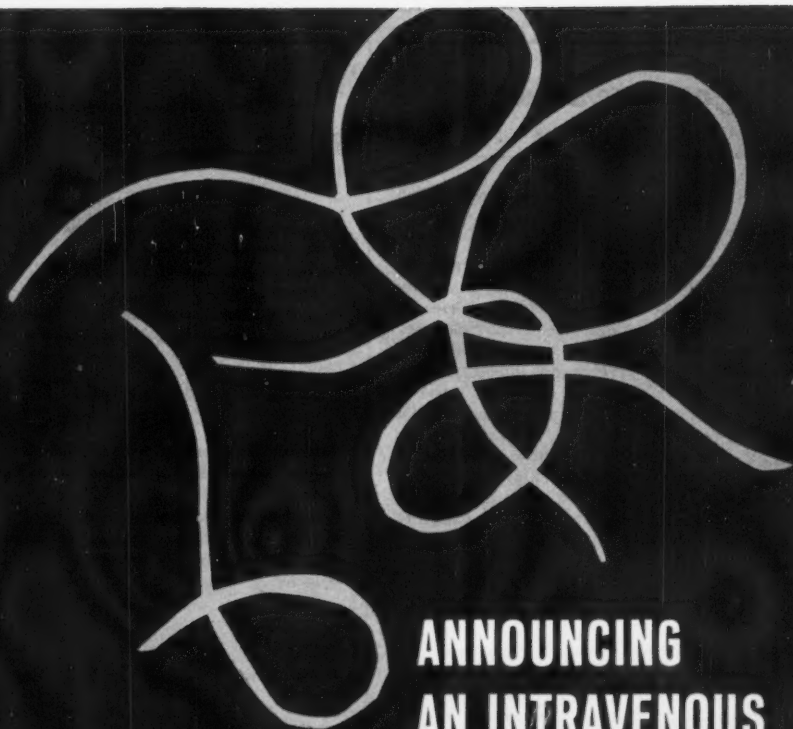
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Published semimonthly at 600 S. Michigan Ave., Chicago 5, Ill., by the American Veterinary Medical Association. Second class postage paid at Chicago, Ill., and at additional mailing offices. Contents copyright 1960 by the American Veterinary Medical Association.

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1. Edrington, R. W., Smith, G. R., and Ehrenford, F. A., J.A.V.M.A. (Dec. 30) 1967; Ehrenford, F. A., Smith, G. R., and Edrington, R. W., J. Vet. Med. 54: 515-516 (10-12-1969).



Pfizer Inc.

NEW YORK, N.Y. 10017

Correspondence

January 28, 1960

Dear Sir:

There are two subjects that I would like to mention concerning the *J.A.V.M.A.* One is the possibility of including summaries of *J.A.V.M.A.* articles in languages other than English. The foreign veterinary journals that follow this policy are undoubtedly of greater value to world veterinary literature than those that do not. I also believe that, if abstracts of articles from other journals were systematically included in either the *J.A.V.M.A.* or the *American Journal of Veterinary Research*, this would be of great value in increasing communication between veterinarians of this country and those of other nations. Such an abstract endeavor would not have to be restricted to veterinary periodicals.

s/Donald H. Clifford, D.V.M.
University of Minnesota
St. Paul 1, Minnesota

[Editor's Note: Dr. Clifford's suggestions are worthy of consideration. However, the problem of obtaining accurate veterinary medical translations in one or more languages every two weeks has not been solved. Perhaps Interlingua translations would serve. The opinion of our general readership concerning this matter has not been determined.]

✱ ✱ ✱

February 6, 1960

Dear Sir:

On page 22 of the January 1 issue, there is a short article by Dr. John Micuda referring to anesthesia for canine cesarotomy.

The author says to "Give $\frac{1}{4}$ gr. of morphine with atropine subcutaneously, wait 30 to 60 minutes, then give 1/360 gr. of apomorphine subcutaneously (given in this sequence, the latter will not cause vomiting)."

Since morphine is a narcotic and emetic, and since apomorphine is also an emetic, I wonder why the latter is used and what its pharmacological action is.

Very truly yours,
s/FRED J. WIGDERSON, V.M.D.
Hackensack, N. J.

February 22, 1960

Dear Sir:

Apomorphine hydrochloride in small doses has a hypnotic effect and is so classified in most of the literature. This hypnotic effect was first called to my attention by Dr. Reginald A. Stocking, Los Angeles, Calif., after a three-year search on my part at all vet-

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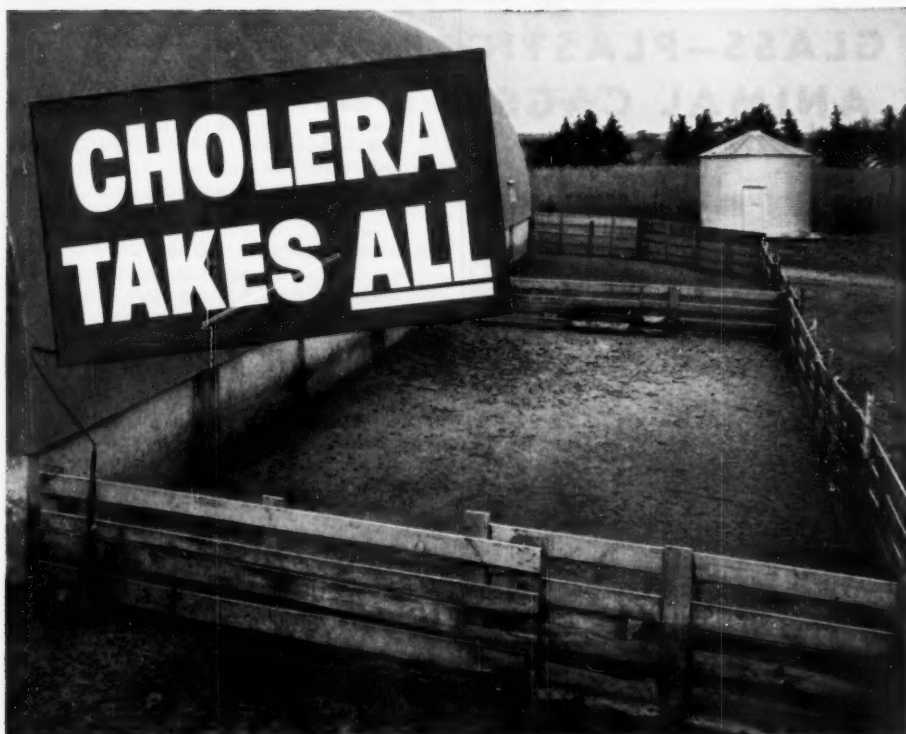
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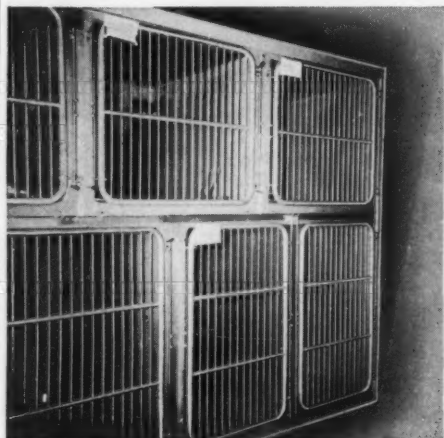
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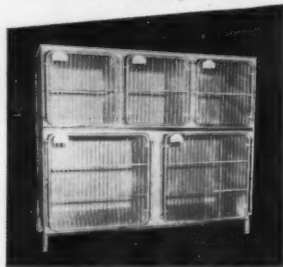
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(Continued from adv. p. 4)

erinary meetings which I attended, seeking an answer to a suitable hypnotic for use on those dogs that wake up in a hyperexcitable state from surgical anesthesia. Especially susceptible is the nervous, high-strung patient like the Greyhound. I had lost three patients in this manner over a six-month period and was quite "gun-shy" to say the least. Dr. Stocking gave me the answer at a question-and-answer luncheon at a veterinary meeting in California.

We have been using apomorphine hydrochloride by subcutaneous injection for this hypnotic effect now for over nine years in our practice and it has proved most satisfactory when used judiciously.

It is a dangerous drug and should be used with care. Overdosage may cause death in the old or debilitated patient. In nine years, the death of 2 patients might possibly be attributed to overdosage or improper administration at the same time that morphine was given. One dog was 8 years old and one was 6. Both were ovariohysterectomized and were discharged the day after surgery. One vomited continuously and died on the eighth day; the other died on the ninth day. At necropsy, neither had visible lesions incriminating surgery as the cause of death. Apparently, the emetic center of the brain was irrevocably stimulated. Since the loss of these 2 dogs, we have never administered morphine and apomorphine simultaneously but have always waited at least 30 minutes after morphine was given before giving apomorphine.

The emetic action of apomorphine is entirely absent and only the hypnotic effect is induced when apomorphine is given 30 to 60 minutes after subcutaneous administration of morphine. This is our clinical observation based on more than 1,200 cases.

In the "United States Dispensary," 1950 edition, page 94, it is reported, "Rovenstine and Hershey brought under control within 5 to 10 minutes the excessive central nervous system stimulation in patients with emergence delirium following general anesthesia, by slow intravenous or intramuscular administration of 1.3 to 2 mg. of apomorphine hydrochloride in 10 cc. of normal salt solution. Similar results were obtained in patients with excessive muscular or psychic activity due to other causes.

"One drawback to its wider use for this purpose is its instability when in solution. The green product formed does not appear to be toxic but it does not possess the peculiar therapeutic properties of the drug."

In our experience, the hypnotic effect without toxicosis seems to persist even after the solution turns green. However, the preparation is so inexpensive that we make a fresh solution after 30 to 60 days. It is kept in a sealed rubber-stoppered vial. If any doubt exists, we make a fresh solution.

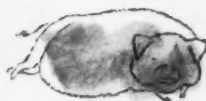
The following quotation is from "Veterinary Pharmacology and Therapeutics" by Dr. L. Meyer Jones, second edition, page 68, "The depressed emetic center is not responsive to the stimulant action of apomorphine. In fact, the central nervous system is further depressed by apomorphine.

(Continued on adv. p. 10)

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REFERENCES: 1. Roe, C. K.: Enteric Infections in Weaned Pigs. Paper presented at the Second Regional Conference on the Nitrofurans in Veterinary Medicine, Madison, Wisconsin, May 28, 1959, p. 10. 2. Hughes, D. L., and McMinn, Jr., C. S.: Furacin—A Control for Gray Droppings. *Am. Fur Breeder* 32:24 (Aug.) 1959. 3. Palarski, J. D.: Furacin Treatment of Gray Diarrhea in Mink. *J. Am. Vet. M. Ass.* 136:177 (Feb. 15) 1960. 4. Johnson, C. A.: Studies on the Efficacy of Soluble Furacin Against Cecal Coccidiosis. Abstracts of papers presented at the 45th Annual Meeting of the Poultry Science Association, Raleigh, N. C., Aug. 7-10, 1956, p. 21. 5. Shumard, R. F.: The Activity of Soluble Furacin Against the Coccidian, *Eimeria necatrix*. Paper presented at the First National Symposium on Nitrofurans in Agriculture, Michigan State University, East Lansing, Michigan, Sept. 28-29, 1956.

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*Anderson, F. B.: Vet. Med. 54:535, (Oct.) 1959.

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(Continued from adv. p. 6)

"Since the emetic center is already depressed by the first administration of morphine we can now get the hypnotic effect of apomorphine (which seems to be greater than morphine) without the emetic stimulation."

Again quoting from the same source as above, i.e., Dr. Jones, page 185, "Morphine will depress the emetic center even to the extent of overcoming the emetic action of apomorphine."

From page 189, "Traditionally morphine has been used cautiously in cesarean section of the dog because of depressing fetal respiration. It now appears this is not the case; fetal respiratory movements are not abolished by dosages of morphine that initiate depression of the maternal respiration and yet produce maternal analgesia. However, fetal respiratory movements may be depressed by huge doses of morphine. A large dose of morphine also seems to interfere with uterine contractions." From page 191, "No analgesia has been observed from apomorphine in the dog." This statement is in direct contradiction with our clinical experience with this drug.

The emetic action of morphine as a preanesthetic for surgery is most desirable. It is amazing the foreign objects, food, and extraneous material a presurgical patient will vomit. I recall a 2-month-old Great Dane pup which was brought to us for an ear-trim. After a preanesthetic dose of morphine, he vomited a pair of elbow-length ladies' gloves. I still shudder when I think of the consequences that could have resulted, had not this pup vomited that pair of gloves.

From "Practical Veterinary Pharmacology, Materia Medica and Therapeutics" by Milks, sixth edition, pages 276 and 277: "Some authors claim that the change in color is not detrimental to the drug." . . . "Small doses are said to be sedative and hypnotic but not narcotic." . . . "Small doses have no effect on circulatory system." . . . "Small doses do not affect respiration." . . . "To make a permanent solution for injection:

Apomorphine Hydrochloride	0.2
Solve in Aquae Dist.	20.0
Ad Acidi Hydrochloridi	0.12
M. Ft.Sol. This is 1 per cent solution."	

In our experience, this concentration is too high. We add a 0.1 gr. tablet of apomorphine to 30 cc. of distilled water to make 1/300 gr. of apomorphine per cubic centimeter.

Still quoting, page 277: "When the vomiting center is depressed by morphine, barbitol, chloroform, etc., there is no vomiting from apomorphine."

From "Materia Medica and Therapeutics" by Wilcox, eighth edition, page 593: "It has been claimed that when given hypodermically at bedtime, in small doses, sleep, closely approaching the normal, ensues. For this purpose it has been employed in acute alcoholism and especially *delirium tremens*."

It appears that some research could be done on the uses of apomorphine and the different effects resulting from varied dosages and concentrations; the stability of the drug in solution; and its effect when administered in conjunction with other anesthetics, narcotics, and hypnotics.

I am well pleased with apomorphine as used in our practice. However, any deviation from the method as outlined, could be dangerous.

s/J. MICUDA, D.V.M.
Phoenix, Arizona

♦ ♦ ♦

March 29, 1960

Dear Sir:

Because of its relationship to your March 1, 1960, *J.A.V.M.A.* editorial on penicillin in milk, I am sending you this excerpt from a letter I wrote to AVMA President Dr. S. F. Scheidy. This letter concerned antibiotic regulations and residues in milk in Denmark.

"In Denmark, addition of antibiotics to feed for young, growing animals is only permitted (according to law) in certain definite amounts and is only to be sold premixed in ready-made packages. On the outside of the packages, there must be a detailed description of the contents and information about the ages of animals for which the feed is recommended. Advertising any eventual effect of the antibiotics against any disease is prohibited.

"Apart from the above, antibiotics can only be applied by or prescribed for animals by veterinarians. Intramammary administration of antibiotics must be applied by a veterinarian in person. Suitable preparations for intramammary use are not available on prescriptions for administration by farmers.

"After intramammary treatment with antibiotics, it is the duty of the veterinarian:

- 1) To instruct the farmer how long he has to withhold milk from market. This time will vary with different preparations.
- 2) To label the buckets containing the milk from the rest of the herd, thereby allowing the creamery the opportunity to test this milk.
- 3) To send messages to the creamery every day, stating how many cows have been treated and on which farms.

"These rules are going to be revised in the near future, and the new law will probably contain detailed regulations concerning:

- 1) How long the milk has to be withheld from market after intramammary treatment with specific rules for each sort of preparation.
- 2) Specific rules for retaining milk of cows which have had antibiotic treatment for any reason; for example, retained placenta."

s/MOGENS G. SIMESSEN
Department of Animal Husbandry
University of California
Davis, Calif.

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FROM THE AVMA WASHINGTON OFFICE
J. A. McCallam, VMD
Brig. Gen. USA (Ret.)

LEGISLATION

House Committee Studies Color Additive Bills

House Commerce Committee continued hearings relating to color additives April 5, 6, on H.R. 7624, S. 2197. A scientific panel, requested by the Committee and selected by National Research Council, NAS, presented their views, particularly on the Delaney provisions (see JOURNAL Oct. 1, 1959, adv. p. 22).

New Self-Employed Tax Deferment Plan Submitted

Treasury department has submitted a supplemental report to Senate Finance Committee on H.R. 10, tax deferment for self-employed persons. It includes discussion of an approach which would grant self-employed individuals treatment comparable to that received by employees covered by qualified pension plans. Senate Finance Committee will meet late April or early May to study suggestions.

Robert A. Forsythe Named for DHEW Post

Senate, April 14, confirmed nomination of Robert A. Forsythe of Minnesota, for Assistant Secretary, DHEW.

NEW BILLS

Federal Aid for Veterinary Education

Sen. Humphrey (D. Minn.), introduced S. 3391, to authorize a 10-year program of federal grants to help finance veterinary medical educational facilities. The Senator, when introducing the legislation, told the Senate (Congressional Record, Apr. 20, 1960), "This Bill arises out of recognition of the increasing significance of veterinary medical education and of the inadequacy of existing facilities."

Importation of Scientific Equipment

H.R. 11573, Rep. Ikard (D. Texas) to provide duty-free importation of scientific equipment for educational or research purposes.

Pesticide Use for Biologic Controls

H.R. 11502, Rep. Wolf (D. Iowa), provides for advance consultation with Fish and Wildlife Service and state agencies before any federal program is started that involves use of pesticides or other chemicals designed for mass biologic controls.

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- (4) Relieves otitis externa, itching and pain, due to excessive cerumen.

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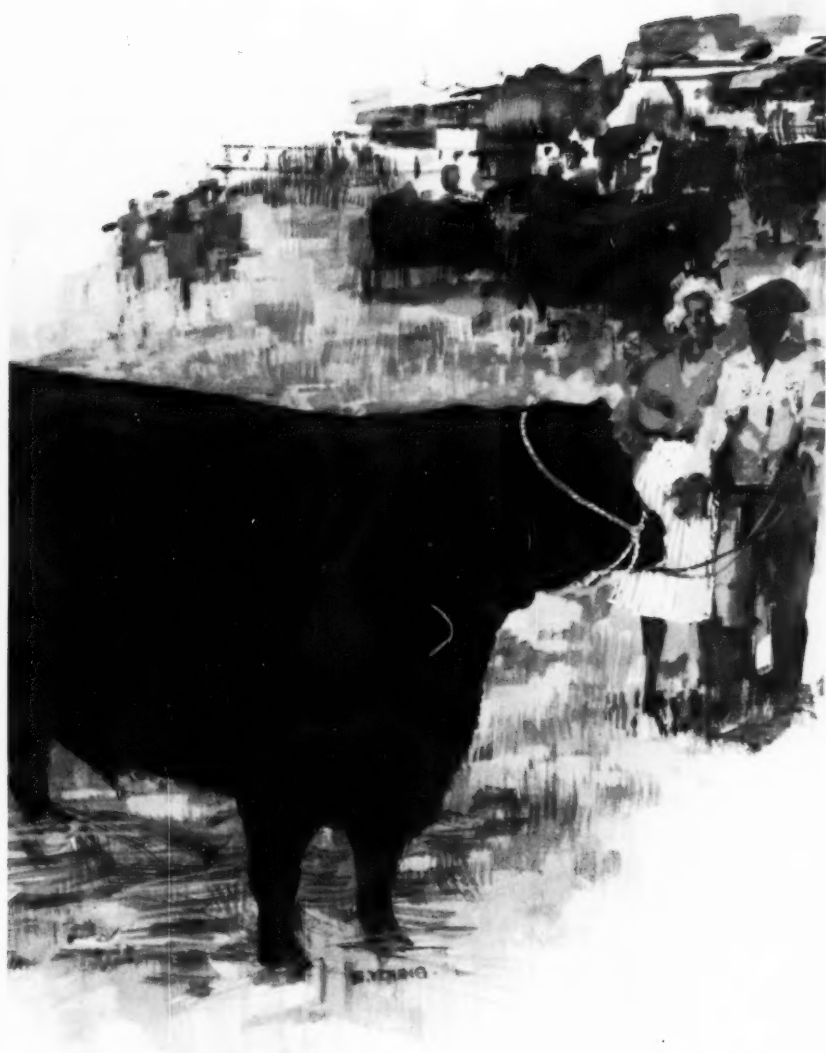


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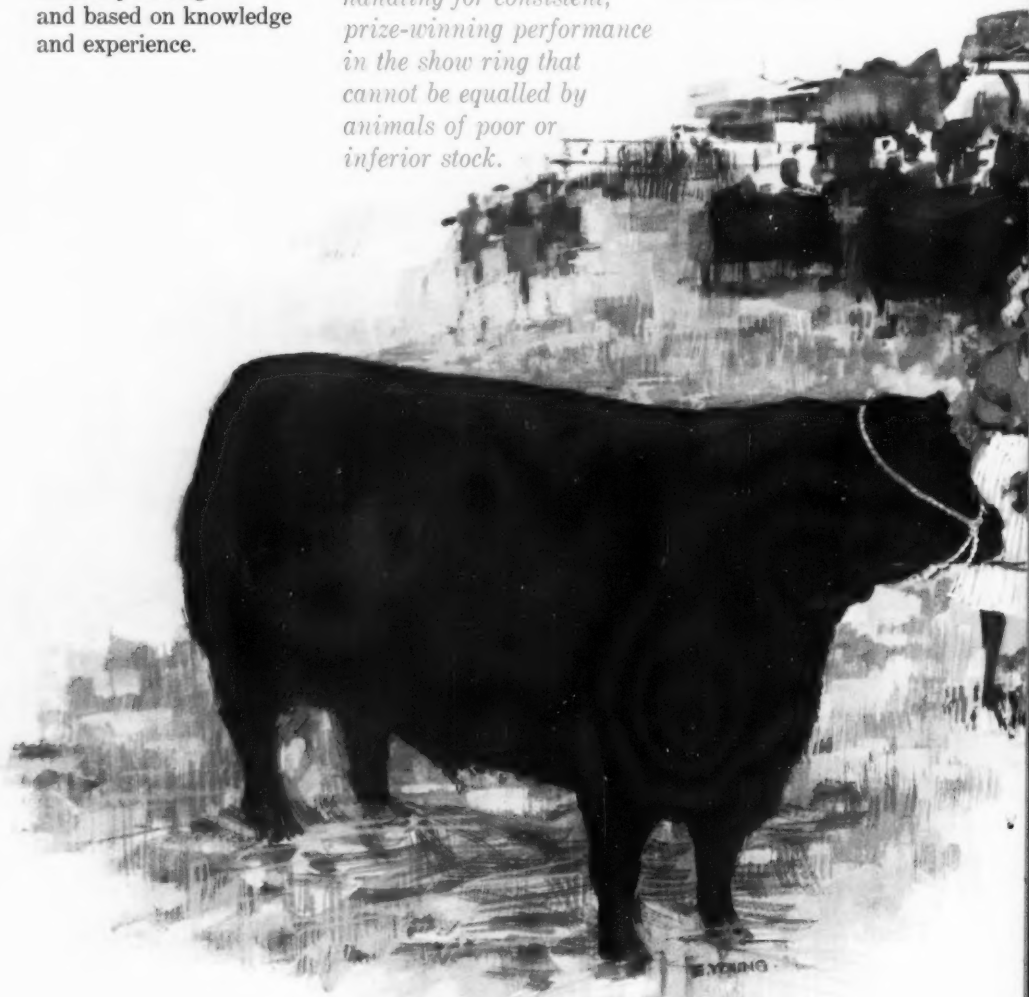
performance

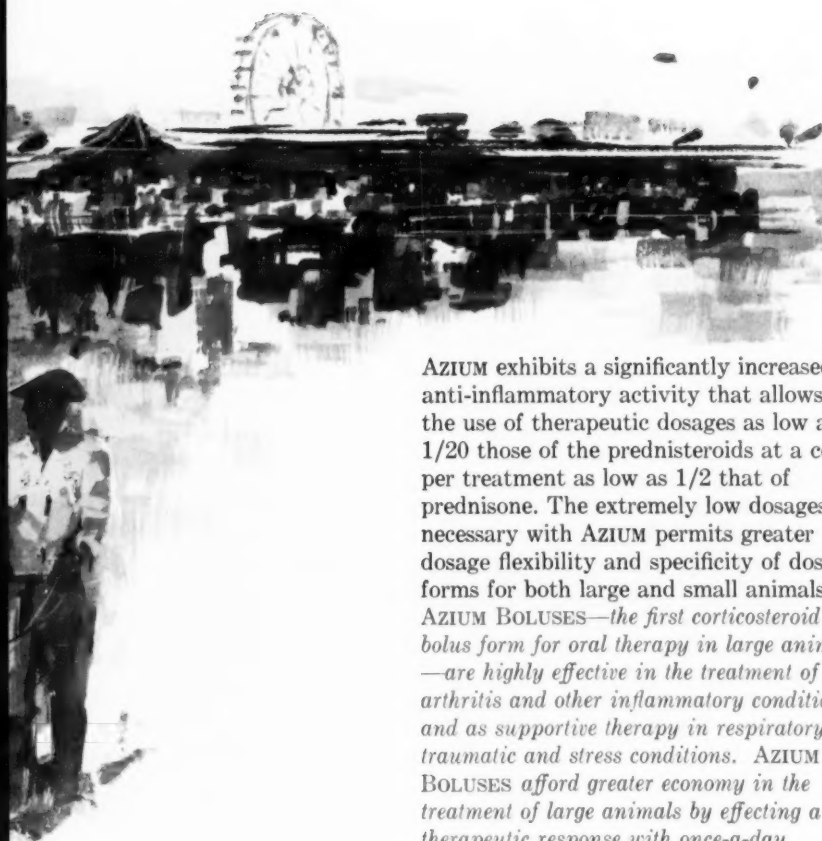
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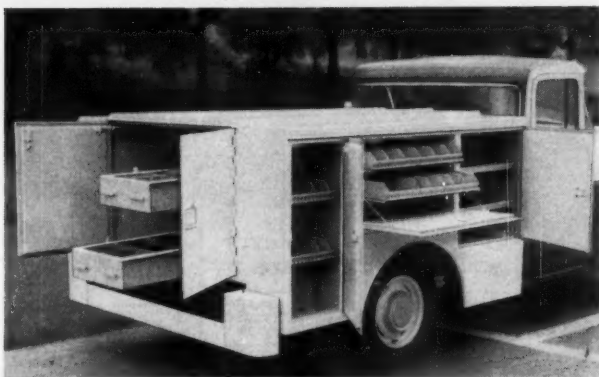
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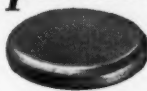
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Folic Acid.....	50 mcg.
dl-Methionine.....	25 mg.
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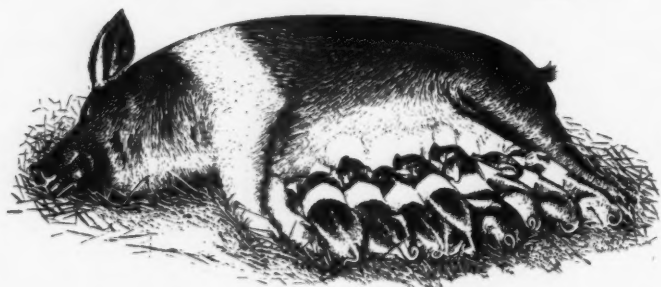
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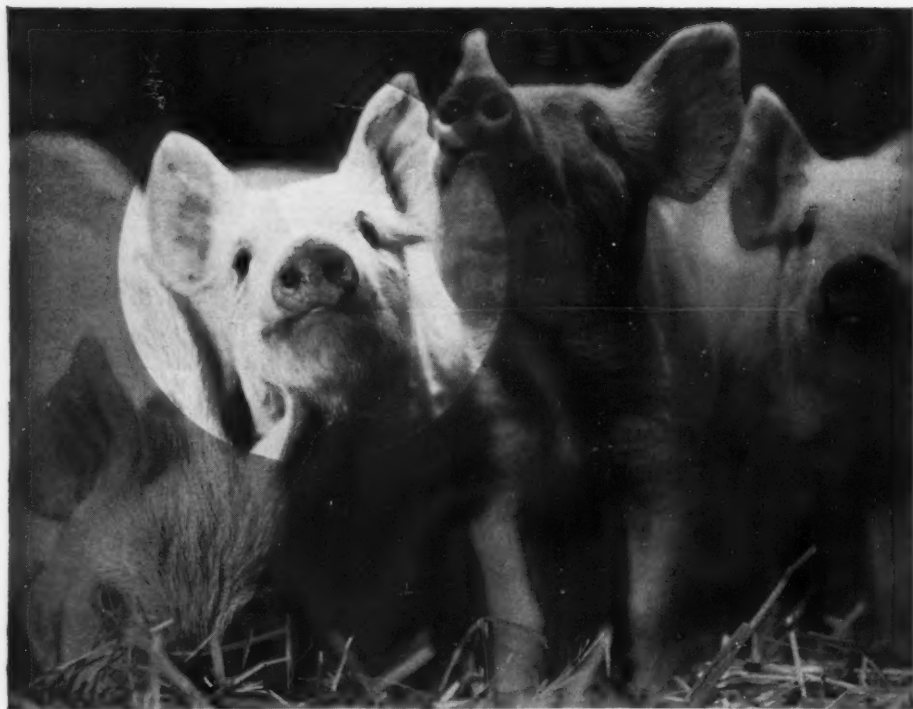
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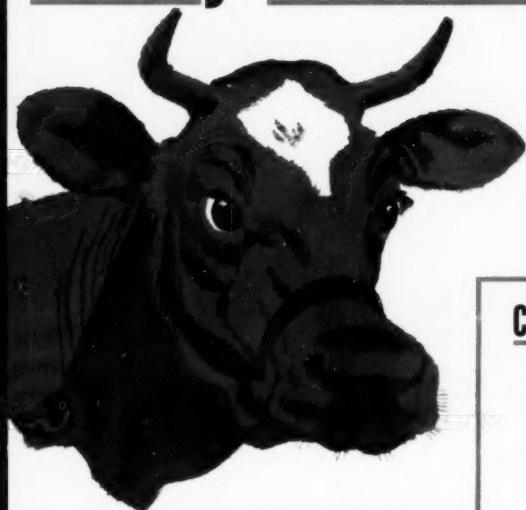
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Relieves many urinary disorders—
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- Designed specifically for large animals
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Each Urised Bolus contains: Atropine Sulfate, 0.01 gr.;
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Dosage: For large animals, one to two Urised Boluses
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Dosage: One or two tablets daily, depending on weight of animal. Give orally, with or without food. Maintenance dosage may be adjusted to individual requirements.

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Veterinary Division CHICAGO PHARMACAL CO.

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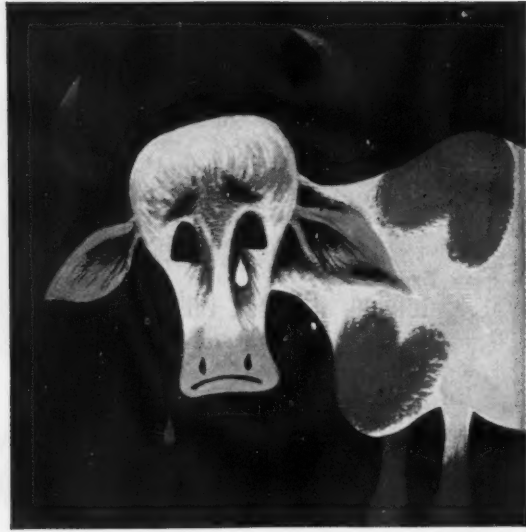
Although developed for pigs, this is a handy way to get AUREOMYCIN into dogs, cats, calves, lambs and laboratory animals.

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Solution Veterinary SQUEEJET[®] and Suppositories Veterinary

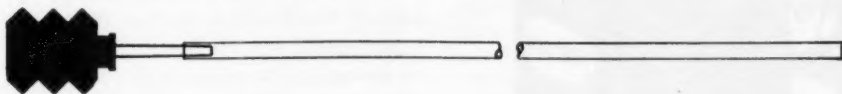
- reduces services per conception
- shortens intervals between calvings

Impaired fertility in cows, commonly accepted to result from non-specific genital infection, responds dramatically to the 2-step treatment method with FURACIN. In one 3-year study involving treatment with FURACIN Suppositories Veterinary, of approximately one-half of 530 "problem breeders": "The average number of services per conception was 1.88 in the treated and 2.85 in the untreated cows. The average number of days between calvings was 385 in the treated and 447 in the untreated animals."¹

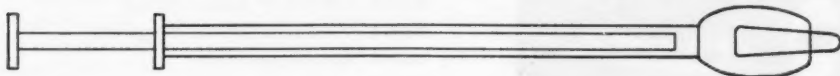
In a study with 85 subfertile dairy cows, 61.7% of 34 treated with an intra-uterine injection of FURACIN Solution Veterinary conceived at first service, while only 19.3% of 31 treated in an identical manner with 10% saline solution conceived at first service; 40% of 20 non-treated controls conceived at first service.²

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STEP 1. During estrus, instill, aseptically, the contents of 1 to 3 SQUEEJETS (30 to 90 cc.) of FURACIN Solution Veterinary into the uterus by means of a uterine pipette.



STEP 2. During the following 3 weeks, insert 1 FURACIN Suppository Veterinary into the anterior portion of the vagina 3 times each week on alternate days.



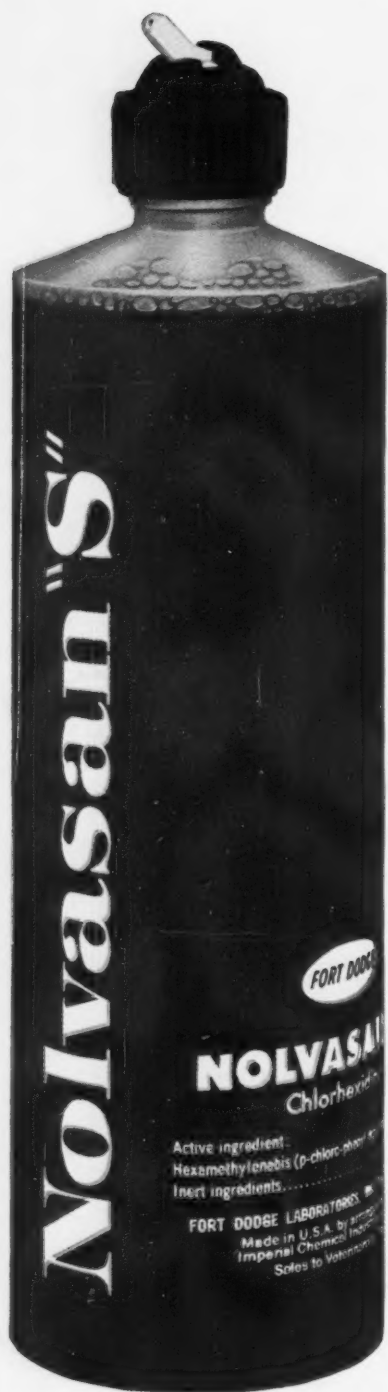
The cow may then be bred during the next estrus.

Supply: FURACIN Solution Veterinary SQUEEJET (30 cc. each), boxes of 12; FURACIN Suppositories Veterinary, boxes of 12.

1. Vigue, R. F., et al.: J. Am. Vet. M. Ass. 134:308 (April 1) 1959.

2. Vigue, R. F.: Personal communication.

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Vol. 136

No. 10

May 15, 1960

Journal

OF THE
AMERICAN VETERINARY
MEDICAL ASSOCIATION

Concentrations of

Penicillin in Milk

of Cows Following Intramuscular Administration

H. BLOBEL, D.V.M., PH.D.

C. W. BURCH, D.V.M.

DIFFUSION OF penicillin from blood to milk has been studied by a number of investigators. No measurable amounts of penicillin were detected in milk of a normal cow given 500,000 units of this antibiotic intravenously.⁵ Up to 1,000,000 units of penicillin was administered intramuscularly to normal heifers and the drug was not detectable in the milk.⁸ Similar results were obtained by others² who stated that the lactating bovine udder is apparently non-permeable to penicillin.

Measurable amounts of penicillin could be demonstrated in the milk of 2 cows following subcutaneous administration.⁹ One of these cows was given a total of 16,250,000 units of amorphous penicillin sodium and the other cow 17,250,000 units of

crystalline penicillin G sodium. In each case, the drug was administered at the rate of 5,000 units/lb. of body weight for the first dose and 2,500 units/lb. for 3 subsequent doses at 6-hour intervals.

Significant amounts of penicillin were detected in the milk of 4 cows when high blood levels were maintained by repeated intramuscular injections of 10,000,000 units of dibenzylamine penicillin G.⁷ Two cows were given, intramuscularly, 5,000 units/lb. of body weight of procaine penicillin G in aqueous suspension, and 1 cow was given the same dose of procaine penicillin G in oil.⁴ Penicillin could be detected in the milk for 3 days following injection of the aqueous suspension and for 5 days after the administration of the oily suspension.

These studies have been undertaken to obtain more information concerning concentration and persistence of penicillin in the milk of cows following intramuscular administration of currently used doses of procaine penicillin G crystalline preparations.

From the Department of Veterinary Science, University of Wisconsin, Madison.

Published with the approval of the Director of the Wisconsin Agricultural Experiment station as paper NS283.

The authors appreciate the technical assistance of Miss A. Dencke.

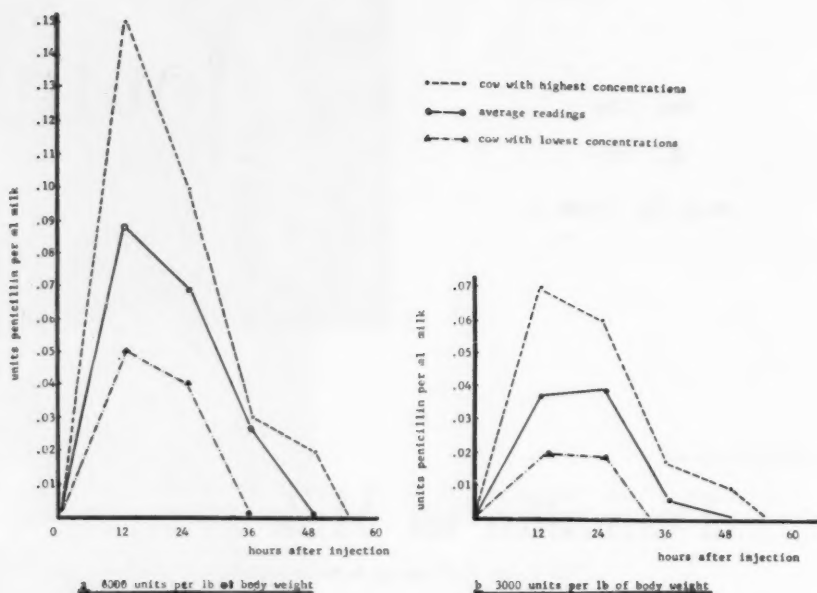


Fig. 1—Penicillin concentrations in milk of cows injected intramuscularly with penicillin G procaine crystalline in aqueous suspension.

Materials and Methods

Procaine penicillin G crystalline in aqueous suspension was injected intramuscularly into 24 lactating cows: 9 Holstein-Friesians, 7 Guernseys, 6 Brown Swiss, and 2 Jerseys.

Procaine penicillin G in sesame oil with 2 per cent aluminum monostearate was administered intramuscularly to the same cows 7 days later (after penicillin residues had completely dissipated following treatment with the aqueous preparation).

Eight additional lactating cows (2 of each breed) served as controls. Bucket milk samples were collected from all 32 cows. Milking started at 5 a.m. and 4 p.m.

Fresh milk samples were assayed for penicillin, employing the overnight cylinder-plate method as recommended by the Food and Drug Administration.⁶ Rectangular Pyrex trays (19.0 by 30.5 cm.) covered with aluminum foil were used instead of Petri dishes. Approximately 150 ml. of the base agar was poured into a sterile tray, which was tilted to ensure even distribution of the agar and placed on a level surface. After

hardening of the base layer, 50 ml. of the seed agar containing the test organism *Sarcina lutea* (ATCC 9341) was added. The inoculated trays were used within 2 or 3 hours. Sixty stainless steel cylinders, evenly spaced, were placed on each tray. The threshold sensitivity of the cylinder-plate method was approximately 0.0045 units of penicillin per milliliter of milk.

In all tests, penicillin was identified by the use of penicillinase.

Results

Duration and concentrations of penicillin in milk of cows following intramuscular administration of 3,000 or 6,000 units of procaine penicillin G crystalline in aqueous suspension per pound of body weight are shown (fig. 1 a, b). At both dosage levels, penicillin could not be detected for more than 60 hours in the milk of any of the 24 cows injected with the antibiotic. The milk of some of these cows gave negative inhibition tests 36 hours after injection.

When procaine penicillin G crystalline in sesame oil was administered intramuscularly at dosages of 3,000 or 6,000 units/lb. of body weight, some of the 24 cows required up to 132 hours for the elimination of significant concentrations of the antibiotic from the milk; others, only 36 or 48 hours (fig. 2 a, b). Some correlation between milk production and penicillin levels was observed; generally, the antibiotic persisted in the milk of low-producing cows at higher concentrations for a longer period than in the milk of high producing cows.

No inhibitors could be found in the milk of the experimental animals before every trial or in the milk of the control cows throughout these studies.

Discussion

The significance of penicillin in milk devolves chiefly around the question of its potentiality to cause allergic reactions, particularly in previously sensitized persons. To modern veterinary practice, penicillin is one of the indispensable drugs. Therefore, a need has developed for more explicit information regarding the time required for its elimination from the udder after administration by various routes.

After intramuscular injections of procaine penicillin G crystalline in aqueous suspension in sesame oil, concentrations of the antibiotic differed from 1 cow to another. These variations, particularly in the case of the sesame oil preparation,

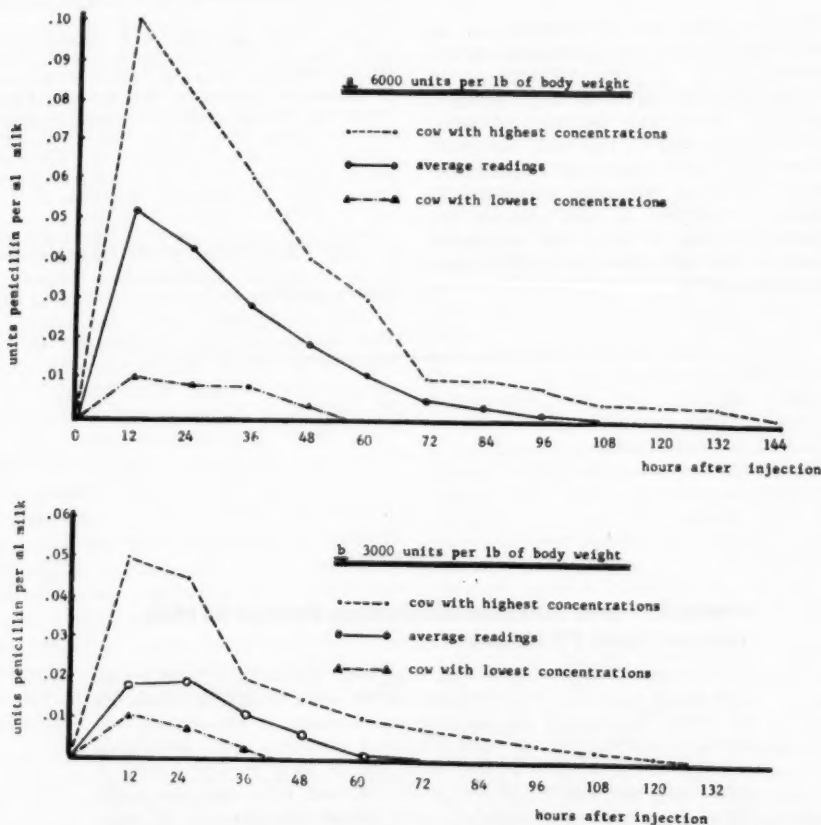


Fig. 2—Penicillin concentrations in milk of cows injected intramuscularly with penicillin G procaine crystalline in sesame oil.

could be related somewhat to milk production. The antibiotic persisted in the milk of low producing cows for a longer period than in the milk of high producing cows. Notable breed differences could not be observed.

The cylinder-plate method, used for the assay of penicillin in these studies, has a sensitivity threshold of approximately 0.0045 units/ml. of milk. Thus, it is considerably more sensitive than commonly used "screening procedures," including the rapid disc assay method described by Arret and Kirshbaum¹ and the 2,3,5 - triphenyltetrazolium chloride (TTC) test of Neal and Calbert.³

Summary

Procaine penicillin G crystalline in aqueous suspension was administered intramuscularly to 24 cows at dosages of 3,000 and 6,000 units/lb. of body weight, respectively. Measurable amounts of penicillin did not persist in the milk for more than 60 hours after injection. When 3,000 or 6,000 units of procaine penicillin G crystalline in sesame oil was injected intramuscularly into 26 cows the antibiotic persisted in the milk from 36 to 132 hours at detectable levels.

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Penicillin and Sulfonamides May Persist in Milk Longer than 72 Hours

A recent Ohio study showed that cows receiving 1½ to 3 million units of penicillin intramuscularly shed detectable amounts of penicillin in milk for as long as 84 hours. A cow which was given 100,000 units in each of its 4 quarters shed detectable amounts of penicillin in her milk for as long as 132 hours. A cow that was given 150,000 units infused into only the right front and right rear quarters shed detectable amounts of penicillin in all 4 quarters as long as 84 hours. Sulfonamides have been demonstrated in milk for as long as 89 hours after oral administration of the drug.—*Anim. Dis. Trends*, 8, (1960): 3.

Role of Animals in Relation to Human Viral Diseases

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THERE ARE more than 200 infectious, communicable diseases of animals. Almost half are known to be transmissible from animal to man.^{1,6} In recognition of the fact that human health is inextricably related to health of animals, the viruses could be considered as the least explored agents of investigation in veterinary public health.

Eastern Equine Encephalomyelitis in Maryland

The recent epizootic of eastern equine encephalomyelitis (EEE) during the fall of 1959 in Maryland's eastern shore area greatly alarmed public health authorities there. Fifteen to 20 cases in horses were reported from September 13 to October 15. The EEE virus was isolated from brain tissue of 2 horses. Serologic studies of horse serums, using both hemagglutination-inhibition and serum-neutralization tests indicated the prevalence of EEE. In addition to horses, EEE virus has been isolated from sparrows and chukars caught near Laurel, Md.⁷ Although EEE is no longer a major threat to horses, its persistence in horses and wild birds perpetuates it as a potential public health problem.

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Part of this paper was presented at the 95th annual AVMA convention, Philadelphia, August, 1958, and at the 86th annual meeting of the American Public Health Association, St. Louis, Mo., October, 1958.

Measles-Canine Distemper Relationship

During the past few years, reports from various laboratories have indicated the antigenic similarities of human measles and canine distemper viruses. An epidemic of respiratory disease (primary pneumonitis) in newborn infants and young children was reported.² Later, serologic and pathologic studies suggested a possible relationship to canine distemper virus (CDV).² The presence of neutralizing substance for CDV in human gamma globulin and in some samples of human serums was reported. Failure to demonstrate any neutralizing titer from serum samples of normal, premature infants was reported.¹³ Further reports¹⁴ have confirmed these findings and also indicated that the neutralizing substance is transmitted via the placenta from the mother to the newborn infant. The antibody substance disappeared at the end of 6 months and reappeared in almost 100 per cent of the serums of adults in human populations between the second and tenth years. Recent studies in Sweden³ further supported such results—11 of 14 measles patients gave a fourfold rise of CDV neutralizing titer from the acute to the convalescent phase.

With the aid of tissue-culture methods, the Edmonston strain of measles virus grown in tissue culture was neutralized by distemper antiserum prepared in ferrets, using both egg-adapted and mouse-adapted strains of CDV. None of normal, control ferret serums showed any neutralization of measles virus.³ Although canine distemper and measles seemed to be antigenically related, it would appear that they are 2 dis-

tinct entities caused by well-recognized respiratory viruses in their respective hosts — dog and man.

The measles virus is readily grown in various monolayer cells in tissue culture. Canine distemper virus has been successfully adapted to dog kidney tissue-culture preparations¹⁸ and also to dog testicular cells in tissue culture.¹⁹

Recently, a vaccination trial was conducted in a state hospital in California. A threefold reduction in the attack rate of measles was observed in subjects receiving distemper vaccine, when compared with 3 control groups.⁴ Further field trials may prove that canine distemper vaccine is useful in the prevention of measles in man.

Hemadsorption Type 2 and Sendai Virus Relationship

With the aid of the hemadsorption (HA) technique,²¹ 2 viruses, HA type 1 and HA type 2, were isolated in tissue culture from children with respiratory illness.⁹

Sendai virus was first isolated in Japan from an epidemic of pneumonitis in infants.¹² The illness caused by this virus in human beings resembles an influenza-like illness in adults and may result in severe and often fatal pneumonitis or in an aseptic meningitis syndrome in infants and children. To signify the role of animals from the standpoint of epizootiology, Sendai virus has been recovered by chicken embryo inoculation from the samples collected from swine manifesting influenza-like illness. When the virus was given to a group of susceptible swine, it produced a respiratory illness with the signs of pulmonary edema, hemorrhage, and respiratory distress. Other than from man and swine, Sendai virus has also been isolated from normal mice.¹²

Like influenza A, B, and C viruses, Sendai virus grows well in embryonating eggs following amniotic inoculation¹² and also shares a common antigen or antigens with the "myxo" group of viruses. On the other hand, the virus was antigenically distinct from other viruses; therefore, it was suggested that the virus be called influenza D of man. A recent serologic survey indicates that HA type 2 is closely related to Sendai virus. Therefore, the Virus Subcommittee of the International Nomencla-

ture Committee classified the HA type 2 and Sendai viruses as myxovirus, para-influenza I.⁵

Hemadsorption Virus Type 1 of Man and Para-Influenza Type III Virus of Cattle

Type 1 HA virus was isolated from 35 children, 27 of whom were exposed to a febrile respiratory disease in a nursery, and the remainder had pharyngitis, bronchiolitis, and pneumonia.⁹ Further studies with 117 paired serums obtained from children hospitalized with severe febrile respiratory illness during the winters of 1957 and 1958 indicated that 28 per cent of these paired serums showed serologic evidence of both HA types 1 and 2 viruses. Type 1 was found to be significantly more prevalent among the nursery children.⁹

Like HA type 1 virus, a myxovirus has been recently isolated from young cattle with shipping fever.^{11,17,20}

The virus grows successfully in bovine, porcine, and monkey kidney tissue cultures, producing cytopathic changes in the cells. Serologic studies were made for para-influenza III virus antibodies in 191 paired serum samples from calves, with and without clinical shipping fever. A significant rise in antibody titer was observed in 68.6 per cent (131 calves) of the animals.¹¹ The widespread incidence of the virus in the cattle population was also detected by tests of serum samples collected throughout the year from calves being raised on isolated farms in areas surrounding Kansas City.²⁰ Both the viruses were found to be serologically identical when compared by the complement-fixation, serum-neutralization, and hemadsorption tests.¹ The significant role of these viruses in man and cattle should be considered from the standpoint of public health epidemiology particularly, since both viruses are involved in respiratory illness in their respective hosts.

The Role of Cattle in Poliomyelitis in Man

The role of animals as reservoirs or healthy carriers of viruses has received more attention since it was found that the serums from 150 normal, healthy cows on 4 farms contained neutralizing antibodies against types 1, 2, and 3 polio viruses.⁶ Later, neutralizing substances for types 4

and 5 of Coxsackie B viruses were also detected in cattle serums.

Type 1 polio virus was isolated from the fecal sample of a 4-week-old calf, and the presence of type 1 antibodies in this animal serum was demonstrated at the time of virus isolation.¹⁵

The Role of Animals as Healthy Reservoirs of Adenoviruses of Man

Neutralizing substances in bovine serums for adenoviruses were demonstrated when the bovine serum used in the maintenance medium inhibited propagation of type 3 adenovirus in HeLa cells tissue culture. Later, it was found that types 4 and 7 adenovirus also were inhibited to a great extent, and types 2 and 6 were least affected by the serum.¹⁰

In preliminary studies, the antibody response for adenovirus types 2 and 3 was observed in healthy farm dogs.

This group of adenoviruses is considered one of the most important viruses causing acute respiratory illnesses of man, particularly during times of war. These infections presented a serious medical problem to the armed services¹² during World War II (1942-1945). It was estimated that more than the equivalent strength of one army division was absent from duty every day of the war because of common respiratory diseases. These illnesses are prevalent during the winter months; furthermore, the disease is confined almost entirely to recruits during their first 2 months in the service and is far less common among "seasoned" troops who have completed their basic training and have become adjusted to military life.

The viruses are prevalent in the civilian population, also. More than 20 serotypes have been isolated from man; types 1, 2, 3, 4, 5, and 7 are prevalent in both civilian and military populations. Type 8 virus which causes epidemic keratoconjunctivitis in man is prevalent in Japan, but not in the United States.

Experimental pathogenesis studies reported here indicate the possible role of dogs as reservoirs of infection and in transmission of adenoviruses, types 2, 3, 4, and 7 from dogs to dogs and to man.

Materials and Methods

Adenoviruses types 2, 3, 4, and 7 were grown in HeLa cells and their titers were

as follows: type 2, 10^3 t.c.d.₅₀ per milliliter; type 3, 10^4 t.c.d.₅₀ per milliliter; type 4, $10^{3.5}$ t.c.d.₅₀ per milliliter; and type 7, 10^4 t.c.d.₅₀ per milliliter.

Normal, healthy dogs, 4 to 6 months old, were selected, and blood samples were taken to determine previous exposure to adenoviruses prior to experimental use. The dogs were kept in isolation units for 2 weeks for further observation. Later, the dogs were allotted to groups, and the throat of each individual was swabbed with 100 t.c.d.₅₀ of adenoviruses. The dogs were identified and infected with each type separately and were kept for observation in separate isolation rooms (table 1). Body temperatures were taken and blood counts were made on these animals throughout the experiment. The pre- and postexposure samples, such as blood, saliva, and fecal materials, of the dogs were collected in tubes containing 1 ml. of phosphate buffered saline with penicillin, streptomycin, and nystatin, and were stored at -20°C .

HeLa cells are known to be the most suitable and practical for use in the laboratory for isolation of certain viruses for serologic purposes. For this work, HeLa cells were grown in tubes containing the growth medium 199, with added antibiotics and 20 per cent horse serum. When the monolayer sheet of cells was formed, the growth medium was removed, and 1 ml. of maintenance medium (medium 199 and 0.5% lactalbumin hydrolysate) was added to each tube.

The samples for isolation studies were centrifuged at 1,500 r.p.m. for 10 minutes, and 0.2 ml. inoculum (supernatant fluid of the samples) was inoculated into each tube. Three tubes of HeLa cells were used for each sample in the preliminary isolation studies. The inoculated cells were kept in the 37°C . incubator for 4 to 6 hours and the medium was then removed from the cells. One milliliter of new maintenance medium was added to each type in order to prevent toxic reactions caused by the inoculated materials and to prevent nonspecific degeneration of HeLa cells during the period of observation. When characteristic cytopathic (CP) changes in HeLa cells in the first passage were observed, aliquots of the culture were transferred to tubes of HeLa cells for the second passage. The characteristic CP effect in HeLa cells of the second passage provided evidence of posi-

tive virus isolation. In cases where virus was isolated from the samples, serum-neutralization (SN) tests followed using type-specific rabbit antisera to identify the virus. The presence of antibodies in the serum samples (0.1 ml. of 1:10 dilution) was also determined by SN test, using 100 t.c.d.₅₀ of adenoviruses.

Results and Discussion

Adenovirus types 2, 3, 4, and 7 were isolated in HeLa cells from the experimentally infected dogs and from some of the contact control animals (table 1). During the viremic stage, the virus was readily isolated from blood samples of the dogs within 24 to 96 hours following experimental infection. Virus was isolated from the saliva sample during the viremia, and persisted in dogs as long as 5 days after exposure.

Although the adenoviruses were isolated from the fecal samples, contamination with bacteria, nonspecific toxins and degeneration of HeLa cells rendered viral isolation difficult or impossible.

No virus was isolated from pre-exposed blood, saliva, and fecal samples of the experimental dogs.

The contact control dogs demonstrated

that the virus could spread from animal to animal and readily yielded virus in the saliva samples.

The type-specific antibodies in the serum samples were observed in the dogs 14 days after experimental infection, which indicated that the dogs had contracted infection and developed immunity. The dogs did not manifest any clinical signs during the period of observation. Body temperatures of both infected and contact dogs remained normal throughout the experiment. No variation in leukocyte counts was observed. The dogs were necropsied at the termination of the experiment. Gross pathologic changes of organs did not occur. Apparently, the animals had remained healthy following inoculation of adenoviruses.

Although the adenoviruses are readily isolated from the saliva samples of experimentally infected dogs and of contact animals, the importance of adenovirus infection of man, from the standpoint of veterinary public health, needs further consideration. The spread of virus from infected dogs to man was observed in 1 of 2 animal caretakers. This man, 25 years old, reported clinical symptoms of adenovirus infection 7 days following experimental exposure of the dogs. The other caretaker, 58 years old, did not complain of any disturbance. Both

TABLE 1—Isolation in HeLa Cells of Adenovirus Types 2, 3, 4, and 7 from Blood, Feces, and Saliva Following Inoculation of Dogs with These Viruses

Adeno Dog type (No.)	Pre-inoc.	Days after experimental infection									
		1	3	4	5	6	7	10	11	12	14
2	1 BFS		(B)F(S)				BFS			FS	B
	3 BFS		(B)F(S)				B(F)S			FS	B
	5 BFS		(B)		F(S)		B	FS			BFS
	6 S		B		F(S)		B	FS			BFS
	7* BFS		BFS		FS		(B)F(S)	F(S)		FS	BFS
3	21 BFS		(B)FS		BF(S)						BFS
	22 BFS		(B)F(S)		BF(S)						BFS
	23 BFS		BF(S)		BFS						BFS
	24 BFS			(B)F(S)		BFS			FS		BFS
	25* BFS			BFS		BF(S)			FS		BFS
	26* BFS			BFS		(B)F(S)			FS		BFS
4	27 BFS		BFS		BF(S)						BFS
	28 BFS		(B)F(S)		BF(S)				BFS		
	31 BFS			(B)F(S)		B(F)S					BFS
	32 BFS			(B)F(S)		E(F)S					BFS
	33* BFS		BFS	BFS	BFS	BFS			BFS		BFS
	34* BFS		BFS	BFS	BF(S)	BF(S)			BFS		BFS
7	8 FS		(B)F(S)				B(F)S			FS	B
	11 BFS		(B)F(S)				BFS			FS	B
	12 BFS		(B)		F(S)		B	FS			BFS
	13 BFS		(B)		FS		B	FS			BFS
	14 BFS		B		FS		B	FS			BFS
	15* BFS		BFS		F(S)		B	FS		FS	BFS

*Contact control animals; B—blood; F—feces; S—saliva. () Samples indicate isolation and identification of virus in HeLa cells; Uncircled samples indicate that virus was not isolated.

caretakers had come in contact with the dogs during the course of the studies. The authors also came in contact with the infected dogs but did not develop signs of acute respiratory infection. Further serologic studies of blood samples collected from the workers directly involved in this experiment indicated that the presence of antibodies in their serums was due to previous exposure and perhaps due to handling of virus in the laboratory. Tests of pre-exposed and convalescent serums of the clinically affected animal caretaker revealed a significant titer of antibodies in the convalescent serum.

The experimental data indicated that contact dogs could receive the virus from the dogs which harbored the adenoviruses and represented healthy carriers of infection. The possible role of dogs in spreading the infection to man through contact under field conditions requires further critical investigation. It is hoped that our limited experimental observations will encourage other investigators to ascertain whether healthy dogs may harbor and spread adenoviruses. Obviously, little is known of the prevalence of the virus in the dog population, even though dogs are in close contact with the human population.

Summary

1) Dogs inoculated with adenovirus types 2, 3, 4, and 7 did not show clinical signs of respiratory distress and remained healthy for 14 days.

2) Adenoviruses were readily isolated from samples of saliva and blood of dogs.

3) Infected dogs could spread the virus to contact control dogs.

4) The spread of adenoviruses from dog to man may be possible, but further epidemiologic studies should be undertaken to ascertain whether they are factors in public health.

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Prostatectomy in the Dog

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THE CANINE prostate gland is subject to a variety of inflammatory and neoplastic changes.² Among the lesions encountered are benign hyperplasia, acute and chronic inflammation, and adenocarcinoma. Although most of these conditions respond to medical treatment alone or in combination with castration, occasional cases are encountered in which conservative methods fail and surgical removal of the gland becomes necessary.

Until 1956, prostatectomy in the dog was seldom performed because no surgical procedure had been developed which overcame the obstacles of inaccessibility and extreme vascularity of the diseased organ. However, a successful operative procedure introduced in that year permitted access to even the most enlarged prostate, and made possible complete visualization of the surgical field at all stages of the operation, complete hemostasis, and removal of all prostatic tissue.¹

Despite its apparent advantages, there have been few clinical reports on the effectiveness of this operative procedure.^{4,5} The purpose of this paper is to record our experiences with this operative procedure and to encourage others to utilize it when prostatectomy is indicated.

Materials and Methods

Six dogs were subjected to prostatectomy at the University of California veterinary clinic during the past 3 years. Five of them suffered chronic suppurative prostatitis; the sixth had prostatic carcinoma.

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The author acknowledges the cooperation of the practitioners who referred these cases to him.

With the dog placed on his back, a woven male catheter was passed into the bladder. The abdominal cavity was entered through a ventral midline incision from the umbilicus to the pubis, with the skin incision curving laterally to the prepuce and penis. The prostatic blood vessels and the vasa deferentia were ligated and divided. Care was taken to avoid the vesical and urethral blood supply and the ureters. Scissors were used to dissect the prostate from the neck of the bladder and from the urethra. When all attachments to the prostate had been freed, the urethra was transected as close to the prostate as possible at either end of it. The neck of the bladder was grasped with Allis tissue forceps while the prostate was slid off the end of the catheter. The catheter was reinserted into the bladder, and the neck of the bladder was reunited with the urethra by end-to-end anastomosis. A single row of simple interrupted or simple continuous sutures with No. 00 chromic catgut proved adequate. The catheter was left in place for at least 48 hours postoperatively. Antibiotics, fluids, antispasmodics, and other supportive therapy were administered as indicated.

Case 1.—A German Shorthaired Pointer, 2½ years old, was referred for treatment of dysuria and hematuria resulting from a cystic prostate. Therapy during the preceding 2 months included surgical drainage of the cyst. The gland had become so large that it was compressing the urethra, obstructing urine flow, and making daily catheterization necessary (fig. 1).

Prostatectomy was performed under ether-oxygen anesthesia. Whole blood was administered during surgery. It was necessary to sever the vasa deferentia in order to free the prostate, but at the owner's request the dog was not castrated. On the dorsal surface of the prostate was found a pear-shaped cyst which held 900 ml. of

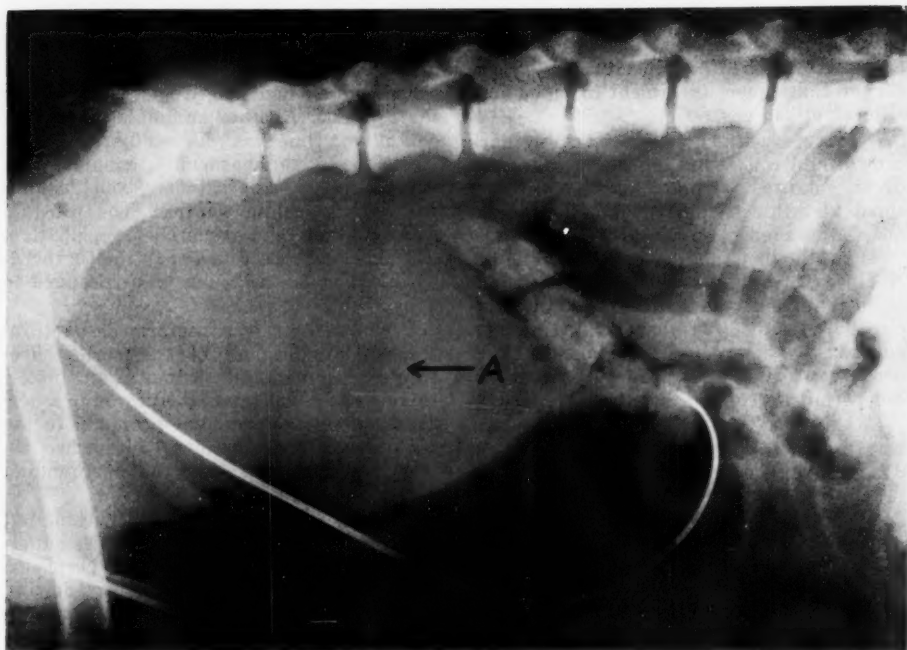


Fig. 1—Pneumocystogram of the Pointer (case 1). The large mass behind the air-filled bladder is the prostate gland. The round areas of lesser density in the center of the mass (A) are believed to be fat globules in the hematoma.

brownish black viscid fluid (blood) and a soft clot (fig. 2). The entire organ measured 11.5 by 15.0 cm. and weighed 2.5 lb. Severe suppurative prostatitis with hemorrhages appeared in the gland.

The catheter was left in place for 4 days, and broad-spectrum antibiotics were administered. The patient was discharged from the hospital on the twelfth day after surgery. Urinary incontinence and occasional hematuria marked the period of hospitalization. Two months later, the owner reported that the general health of the dog was excellent, but the urinary incontinence had persisted.

Case 2.—A crossbred Boxer, 7 years old, was referred for treatment of intermittent hematuria of 1 year's duration. Temporary relief had been obtained with stilbestrol, and this treatment was repeated twice during the next 5 months. In addition, prostatic massage and antibiotic therapy were employed. *Micrococcus pyogenes* and *Aerobacter aerogenes* were isolated from the urine on different occasions. Both organisms were highly resistant to most of the common antibiotics, according to tests *in vitro*.

Following a third episode of hematuria, prostatectomy and castration were performed under pentobarbital anesthesia. The prostate was approximately 8 by 10 cm., with a nodular surface. The pathologic diagnosis was suppurative prostatitis. The catheter was removed after 72 hours, and incontinence persisted for several days.

Hematuria reappeared on postoperative day 14, but disappeared following administration of urinary antiseptics.

Nearly 2 months after surgery, the dog died unexpectedly of acute gastric dilatation resulting from torsion of the stomach.

Postmortem examination of the urinary system revealed a partial stricture at the site of urethral anastomosis, with many adhesions in the area. The bladder was about twice its normal thickness. A moderate number of ecchymotic hemorrhages were present inside the bladder, but it was not severely inflamed. A few small white granules at the neck of the bladder were thought to be calculi. The cause of the gastric torsion could not be established.

Case 3.—A German Shepherd Dog, 7 years old, was referred for treatment of

hematuria of 3 months' duration. Partial prostatectomy had been performed 3 years earlier. Subsequent treatment included both stilbestrol and castration.

At surgery, a large cyst containing dark brown fluid was found on the dorsal aspect of an enlarged prostate. The bladder was small and thickened. The histologic diagnosis was adenocarcinoma of the prostate.

The catheter was removed after 48 hours. No incontinence was observed. Except for minor gaping of the skin incision, the postoperative period was uneventful. However, euthanasia was requested 7 months later because uremia developed. The owner did not permit necropsy.

Case 4.—A Cocker Spaniel, 7 years old, was presented for treatment of recurrent dysuria, painful defecation, and fever. Ex-

ternal urethrotomy had been performed 3 months earlier to remove numerous small calculi which had lodged just proximal to the os penis. Another accumulation of calculi at this time was relieved by the administration of antispasmodics, manipulation with a woven male catheter, and flushing with sterile saline solution. The prostate was enlarged and sensitive to palpation. The fever regressed under antibiotic therapy, but myriads of leukocytes continued to appear in the urine.

Prostatectomy was performed. Urethral stenosis at the site of the earlier urethrotomy prevented insertion of a catheter, so a catheter was introduced through a new urethrotomy incision just proximal to the stricture. Many adhesions had formed between the prostate and the surrounding peritoneal surfaces.

The histologic diagnosis was chronic but still active suppurative prostatitis, superimposed on benign prostatic hyperplasia.

By postoperative day 6, urine was flowing both from the catheter protruding through the urethral incision and from the normal external urethral orifice. Following removal of the catheter, the dog was able to urinate normally. He returned to good health, but was struck and killed by an automobile a few months later. Necropsy was not permitted.

Case 5.—A Springer Spaniel, 14 years old, was presented for treatment because he had not defecated for 3 or 4 days. The dog was thin, dehydrated, depressed, and had been losing weight for 3 or 4 months. The prostate was palpably enlarged, and roentgenographs showed it to be approximately 6 by 10 cm. Because of the dog's advanced age and poor condition, palliative medication only was administered.

One month later, dysuria and hematuria appeared. Palpation of the prostate increased the amount of blood in the urine. Defecation was painful. A purulent ocular discharge was present. Temperature was subnormal.

Despite the dog's moribund state, prostatectomy was performed. There were numerous adhesions of the prostate to the bladder, colon, and surrounding tissues, so that extensive dissection was necessary in order to free the prostate for removal. During this process, the left ureter was inadvertently severed but it was later anastomosed into the bladder.

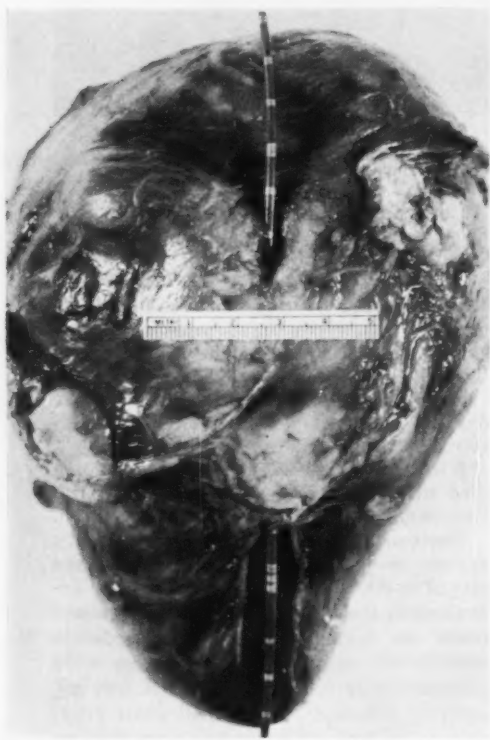


Fig. 2.—Ventral view of the prostate and its hematoma seen in figure 1. The catheter shows the location of the urethra. The "neck" of the pear-shaped mass lay in the pelvic cavity. The trigone of the bladder was adhered to the depression at the opposite end of the lesion.

The patient survived the operation, but continued to decline and died 3 days later. In addition to chronic suppurative prostatitis with cystic dilatations, necrotizing cystitis, pyelonephritis, and peritonitis were present.

Case 6.—An English Bulldog, 6 years old, was referred for the treatment of intermittent hematuria of 1 year's duration. Each attack had subsided under antibiotic therapy, but the hematuria returned. During this period, external urethrotomy had been performed to remove urethral calculi, and a diagnosis of prostatitis was confirmed by exploratory laparotomy 7 months prior to referral.

The prostate was palpable abdominally. Despite normal urination, the presence of urethral calculi prevented preoperative catheterization. External urethrotomy was, therefore, performed in conjunction with prostatectomy. The surgery was performed under ether-oxygen anesthesia, and whole blood was administered during the operation. The owner requested that castration be avoided.

The prostate was 10 cm. in diameter and exhibited chronic inflammation. Two dozen small, smooth calculi were removed from the urethra, 2 of them from the prostatic segment, and one 8-mm., mulberry-shaped calculus was extracted from the bladder. All were composed primarily of cystine. *Micrococcus pyogenes* and green streptococci were cultured from the urine, the pH of which was 6.0.

Postoperatively, the catheter became plugged frequently and it was necessary to flush it once or twice a day with sterile isotonic saline solution. The catheter was removed on the fifth day after surgery, by which time the patient was in excellent spirits and condition. Sodium bicarbonate, 10 gr. t.i.d. orally, was given in an attempt to alkalize the urine and thereby inhibit the development of further cystine calculi. Five months later, the owner reported that the dog was in excellent health.

Discussion

Mechanical interference with defecation is an early manifestation of prostatic enlargement in the dog. In severe cases, urinary retention with cystitis and occasional urolithiasis assumes greater importance. The cases reported here illustrate that in

advanced prostatic disease, hematuria and dysuria are almost constant findings. The major obstacle to complete recovery after prostatectomy is concurrent chronic urinary tract disease, which also increases the surgical risk. The history in each of these cases, however, indicates that without removal of the diseased prostate no further improvement could reasonably have been expected, and surgery was therefore justified.

Prostatectomy should be performed after the diseased prostate demonstrates its resistance to conservative therapy, but before the general condition of the patient deteriorates to render him unsafe for surgery. In this series, the period of conservative treatment ranged from 2 months to 1 year.

The prostatectomy technique utilized has been carefully conceived and clearly described, and it appears to be the most efficient procedure yet devised for removing the canine prostate. Nevertheless, prostatectomy remains a major undertaking which involves cautious dissection with careful attention to detail. Use of the procedure has emphasized that extreme care must be taken to identify and avoid the ureters. In the extensive inflammatory adhesions which occur, they can easily be damaged before they are seen. It is also important to dissect the prostate away from the neck of the bladder as far as possible to avoid damage to the sphincter. The larger the diseased prostate has become, the more critical is this step.

It was presumed at the time that the persistent incontinence in the Pointer (case 1) represented damage to the sphincter. A recently published anatomical study suggests, however, that it may have been the result of bilateral injury to the pelvic nerves.

Because atrophy of the prostate follows castration, this procedure is commonly employed in the treatment of prostatic disease. It might be expected, therefore, that dogs which require prostatectomy would have been castrated at an earlier stage of the disease. However, only 1 of these 6 dogs had undergone such treatment (case 3). Because the vasa deferentia enter the prostate to reach the urethra, it is necessary to sever them in performing prostatectomy. The patient is thereby rendered sterile, a fact which should be mentioned to the owner. Although it is tempting to com-

plete the castration at this time, there is no immediate reason to do so. The fact that 2 owners specifically denied permission for orchiectomy for cosmetic reasons emphasizes the importance of discussing all ramifications of the operation with them before proceeding.

Summary

Six cases of canine prostate disease treated by prostatectomy are presented. Two of the dogs recovered and 2 were significantly improved, while 1 was helped only temporarily and 1 was not helped at all. Hematuria and dysuria were the predominant signs of advanced prostate disease. Secondary cystitis and urolithiasis were factors important in retarding recovery.

Prostatectomy must not be undertaken casually, but when it becomes necessary it should be performed with confidence.

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Encephalomyocarditis Virus Fatal to Swine

During the past 20 years, encephalomyocarditis virus has been isolated sporadically from rodents and primates. It has been implicated as a cause of human disease. This report appears to be the first which the virus was associated with disease in domestic animals.

Encephalomyocarditis occurred in July, 1958, on a commercial swine farm in Panama. Approximately 30 pigs died over a 20-day period in one over-crowded feedlot containing 300, 3- to 5-month-old Duroc and Hampshire pigs. No deaths occurred in other pigs of the same age in an adjacent lot. All pigs had been vaccinated against hog cholera.

On necropsy, hydrothorax, hydropericardium, and ascites were frequently present. Lungs were congested and edematous, with localized consolidation. The heart was soft and pale, with minute yellowish

areas suggestive of necrosis. Meninges were slightly congested. Histologic examination showed a severe myocarditis with round cell infiltration, vascular congestion, edema, degeneration of the myocardial fibers, mild pneumonitis, and mild meningitis.

An agent pathogenic for mice was repeatedly isolated from the lungs and spleens of 2 pigs and from the brain of 1. Encephalomyocarditis virus was identified by neutralization tests in mice and tissue culture. The disease was successfully reproduced by inoculation of 2 young pigs with a mouse-passaged virus.

Myocardial failure was considered the primary cause of death.

Contamination of food and water with the excreta of infected rodents and swine possibly contributed to the spread of the disease.—*Science*, 131, (1960): 498.

Acute Myelogenous Leukemia

with Histopathologic Studies, Following

Total Body Irradiation of a Dog

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THE EXISTENCE of acute myelogenous leukemia in the dog has been a much debated subject. Although a number of such cases have been reported, accurate diagnosis in many is questionable.

One investigator² concluded that most of the reported leukemias actually have been malignant lymphomas with extramedullary hematopoiesis, a condition which is not uncommon in dogs. He stated³ that, in a study of more than 100 cases of malignant lymphomas, he had never observed a case of acute myelogenous leukemia in the dog.

Other authors^{9,10} agree that there were no proved cases of myelogenous leukemia in dogs recorded until 1953, when 3 cases were reported which were believed to be myelogenous leukemias.⁵ However, the findings in the peripheral blood were indistinguishable from leukemia or malignant lymphomas and the diagnosis of leukemia was based mainly on the size of lymph nodes and spleens. In the same year, a case of basophilic leukemia in a dog was reported.¹⁰

In 1957, the report of 8 cases of myelogenous leukemia in dogs appeared in the literature.¹⁶ The diagnoses were made in 4 cases on the basis of necropsy findings only; the other 4 cases were evaluated antemortem by hematologic studies, including staining of peripheral and bone marrow smears for peroxidase reactions. Three of those showed a positive reaction, 1 was negative.

From the Medical College of Virginia at Richmond where Dr. Roscher is a fellow in clinical pathology, Dr. Boatwright is a trainee of the National Cancer Institute and resident in clinical pathology, Dr. Kupfer is professor of clinical pathology, and Dr. Egdhal is an assistant surgery.

The authors thank Dr. Abraham Linder of Richmond, Va., for referring this dog to their laboratory.

It is difficult to make a definite differential diagnosis between myelogenous leukemia, lymphoma, and lymphatic leukemia on the basis of tissue reaction study alone, without hematologic findings. Peroxidase stain on frozen sections may help, since peroxidase reaction is positive in myelogenous leukemia and negative in the other 2 conditions.

In this paper, we report a case of acute myelogenous leukemia in a dog, documented by clinical and hematologic data as well as by results of biopsies and necropsy.

Clinical Course

A 2-year-old male Boxer dog was admitted to the research laboratories of the Medical College of Virginia on July 19, 1958, because of anemia refractory to iron and vitamin B₁₂ therapy and a peripheral blood smear compatible with leukemia. The physical examination revealed a moderately well-nourished dog with lymphadenopathy in the cervical, axillary, and inguinal areas and enlargement of the spleen which extended approximately 5 cm. below the left costal margin.

Six days following admission, the spleen was surgically removed and biopsies of the liver and a mesenteric lymph node were taken. The postoperative course was uncomplicated. Because of gradually increasing anemia, the dog received 4 transfusions of fresh whole dog blood totaling 1,100 ml. between 24 and 29 days after admission. No transfusion reactions were observed.

Thirty days following admission, the dog received a total body irradiation of 600 roentgen (r). A 1,000 kv.p., 3 milliamperere

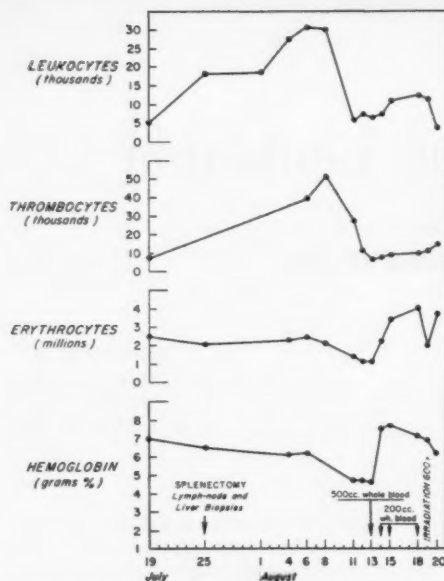


Fig. 1—Hemogram of the leukemic dog during its stay in hospital.

source of x-irradiation without filter was used. At a distance of 100 cm. from the source, the dog was exposed to 300 r on each side over a period of 18 minutes and 9 seconds (amounting to a total dose of 600 r, measured in air). He expired 48 hours after irradiation. The body was kept in a deep freeze and a necropsy was performed 24 hours after death.

Methods of Examinations

Routine methods were used for the determination of the red and white blood cell counts, hemoglobin, and hematocrit values.

Platelets were counted by the Rees-Ecker method. The coagulation factors determined included prothrombin (Quick), factor V²¹, factor VII¹⁸, PTT¹⁴, and fibrinogen level.⁷ Smears of the peripheral blood and bone marrow were examined after staining with Wright, peroxidase,²⁰ and alkaline phosphatase⁸ stains. The plasma proteins were evaluated by paper electrophoresis¹³ using a buffer with ionic strength 0.05 at pH 8.6. Results were compared with electrophoretic patterns obtained from plasma from normal dogs. Frozen liver sections were also stained for peroxidase reactions.²⁰

The white blood cell count was low on admission. It rose gradually during the hospital stay with a subsequent fall to the initial low level. This level was increased only slightly as a result of transfusions. The platelet count was very low on admission, rose gradually, and fell again at the end of hospitalization. Transfusions of fresh dog blood did not influence the low platelet count. Erythrocytes and hemoglobin demonstrated a gradual decrease reversed by transfusions (fig. 1).

The electrophoretic pattern of the leukemic dog plasma obtained before irradiation was compared with the electrophoretic patterns of the plasma of 3 normal dogs (fig. 2). The plasma of the leukemic dog showed a marked increase of the gamma globulin fraction, whereas other fractions remained essentially normal. An increase of the gamma globulin fraction in cases of human leukemia has also been reported by other investigators.^{12,22} Individual plasma protein components were compared, (table 1) and studies of special coagulation factors

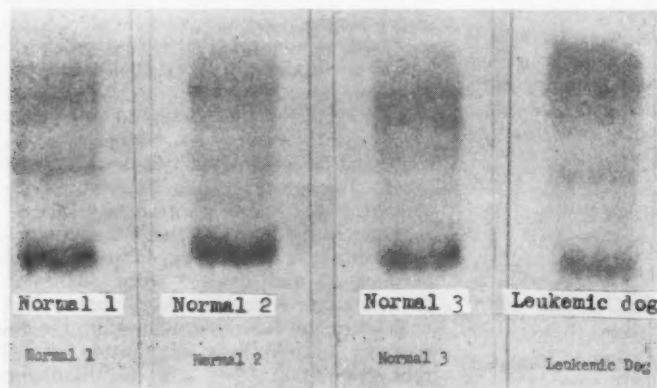


Fig. 2—Comparison of plasma electrophoretic patterns of normal dogs with a leukemic dog.

TABLE 1—Plasma Electrophoresis of 3 Normal Dogs and the Leukemic Dog

Dog	Total protein (Gm. %)	Albumin (%)	Globulins (%)				Fibrinogen (%)
			Alpha ₁	Alpha ₂	Beta	Gamma	
Normal 1	5.8	37.8	6.3	19.5	12.4	9.4	14.9
Normal 2	5.8	43.0	7.4	15.7	11.5	8.5	13.9
Normal 3	6.9	32.0	10.6	11.8	20.4	7.1	18.1
Leukemic	6.3	19.0	5.2	11.3	12.7	35.0	16.8

were summarized (table 2). It is evident from this table that the values of factor V showed some transient postoperative decrease, whereas the values of factor VII were higher than normal. The partial prothrombin time showed some postoperative decrease although the prothrombin time remained normal.

The fibrinogen level decreased significantly during the stay in the hospital. The osmotic fragility of the erythrocytes of the leukemic dog did not differ from that of the control dogs. The morphologic examination of the peripheral blood smear and bone marrow showed the following findings:

Peripheral Smear.—Normocytic hypochromic red blood cells with increased aniso- and poikilocytosis, marked polychromasia and rouleaux formation were present. Platelets were decreased in number and large cellular forms were seen. White blood cells were increased in number with a shift to the myeloblastic stage. There was moderate monocytosis. Doëhle's inclusion bodies were seen in polymorphonuclear leukocytes (fig. 3).

Bone Marrow.—The bone marrow was hypercellular. The red blood cell series was depressed with only a few mitotic figures seen. The granulocytic series showed a marked hyperplasia. Myeloblasts of a uniform type predominated. Many of these showed the presence of Auer's bodies. Phagocytic reticuloendothelial cells with iron granules were present. A rare megakaryocyte was seen (fig. 4). The differential cell count on the peripheral smear yielded the following:

Neutrophils	39 per cent
Myeloblasts	26 per cent
Lymphocytes	17 per cent
Monocytes	6 per cent
Band (Juvenile)	12 per cent
	100 per cent

The peroxidase reactions of the blood films were positive, indicating the myelogenous nature of the leukemic cells, both in the

Table 2—Plasma Coagulation Factors of Normal and Leukemic Dogs

	Normal dogs		Leukemic dog			
	1	2	July	July	August	August
Prothrombin	8.2*	8.0	7.0	8.0	7.0	7.5
Factor V						
50% dilution	38.0	31.0	51.8	—	37.0	33.0
Factor VII						
50% dilution	33.0	30.0	23.3	54.4	26.0	23.5
PTT	26.0	29.0	31.0	25.1	41.0	30.0
Fibrinogen (mg. %)	—	407.0	580.0	31.0	—	2.0

*Numbers represent values in seconds except for fibrinogen level expressed in mg. per cent.

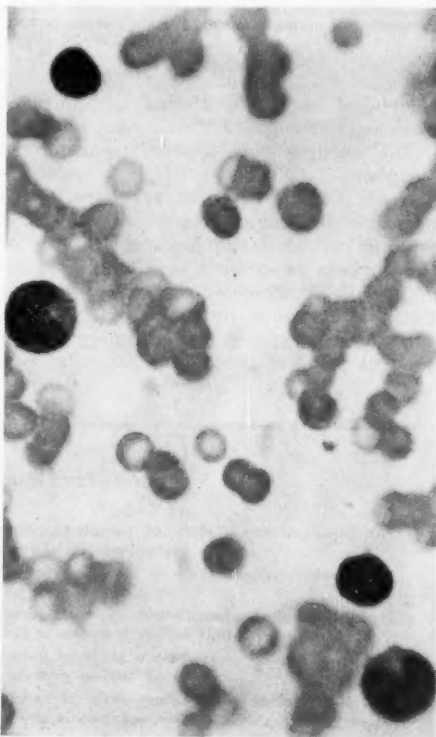


Fig. 3—Peripheral blood smear shows blast cells. Wright's stain, x 900.

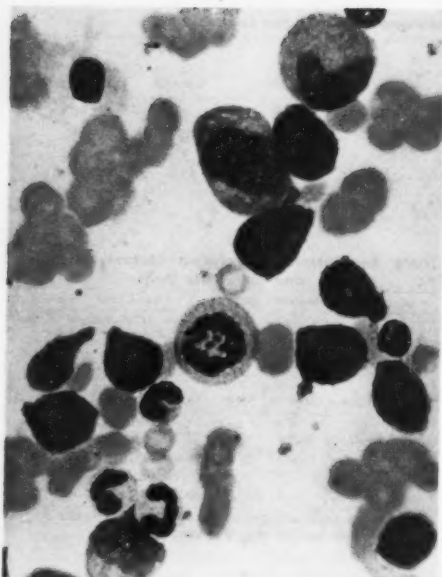


Fig. 4—Bone marrow smear shows marked hypercellularity of myeloid series. Wright's stain, x 900.

peripheral blood smear and in aspirated bone marrow (fig. 5, 6).

The alkaline phosphatase stains of the peripheral blood smear (fig. 7), and bone marrow (fig. 8) showed the cells to be negative for alkaline phosphatase. This finding indicated the leukemic nature of this process as opposed to a leukemoid reaction^{11,17,23,24} which shows a positive alkaline phosphatase stain (fig. 9).

Peroxidase stains performed on frozen sections made of the liver removed at nec-

ropsy showed peroxidase-positive granules in the cytoplasm of the leukemic infiltrates remaining in the periportal spaces after total body irradiation (fig. 10).

The sections of the spleen, lymph nodes, and liver biopsies obtained at the time of splenectomy were stained with hematoxylin and eosin. The lymph node section revealed infiltration of the perinodal fat with leukemic cells, and destruction of the follicular pattern by massive leukemic cell infiltrates. The peripheral sinuses were not obstructed, a finding characteristically seen in leukemias rather than in lymphomas (fig. 11). Changes similar to those seen in the lymph node were also evident in the spleen. The follicular pattern was not preserved (fig. 12).

Giant cells, which were thought to be megakaryocytes, were abundant in the splenic parenchyma (fig. 13). This assumption was confirmed by the presence of the same giant cells showing platelet formation in the imprints obtained from the spleen.

Sections of the liver biopsy showed changes in the periportal spaces. These were broadened and heavily infiltrated with masses of leukemic cells (fig. 15). Cords of liver cells bordering on these infiltrated areas were smaller than the more peripherally located ones, indicating some degree of atrophy. The remainder of the liver tissue was little changed.

Necropsy Findings.—There was evidence of marked recent weight loss. A well-healed midline abdominal surgical scar was seen. There was a scant amount of subcutaneous fat and the body cavities were free of significant amounts of fluid. The axillary, cervical, inguinal, and mesenteric lymph nodes were enlarged, the largest being 2.5

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Fig. 5—Peroxidase stain of peripheral blood smear shows peroxidase positive granules in cytoplasm of neutrophilic leukocytes, x 775.

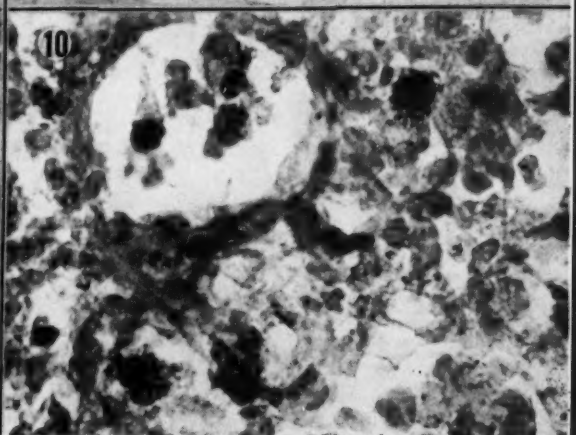
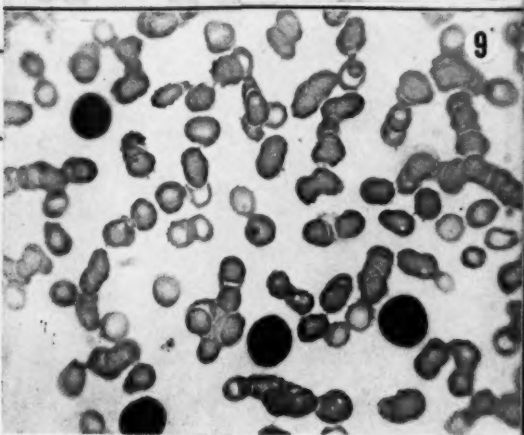
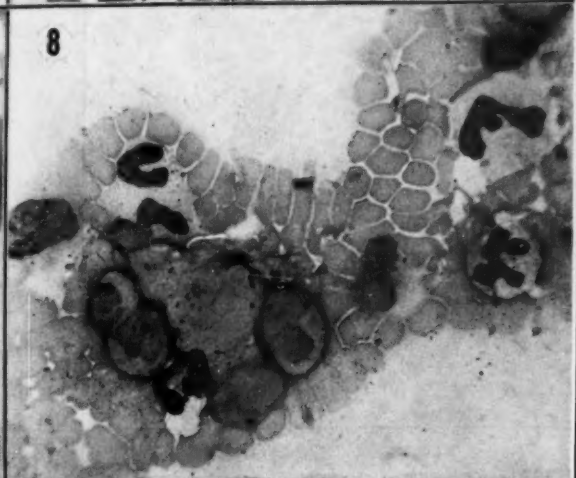
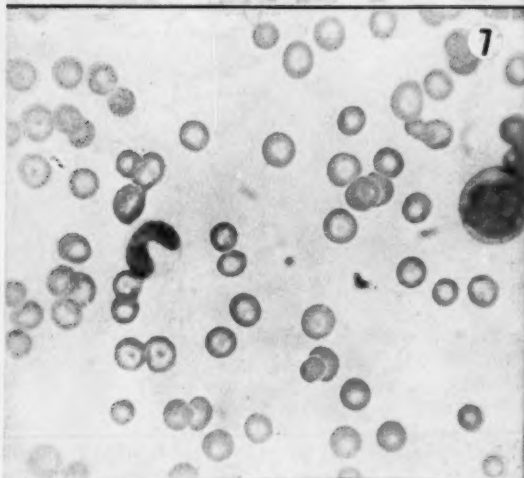
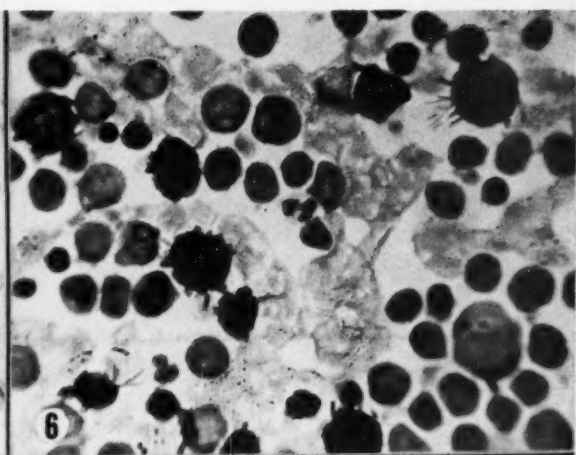
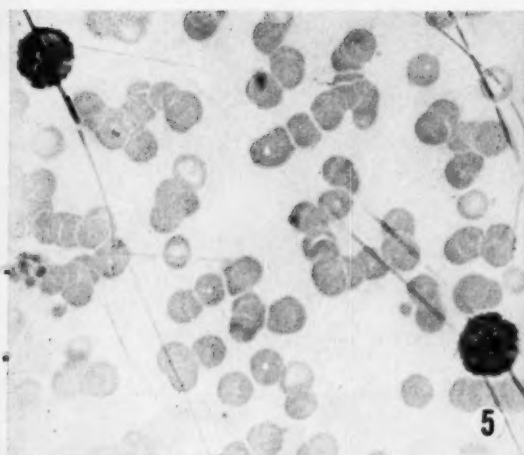
Fig. 6—Peroxidase stain of bone marrow smear shows peroxidase positive granules in the cytoplasm of a large majority of cells, x 775.

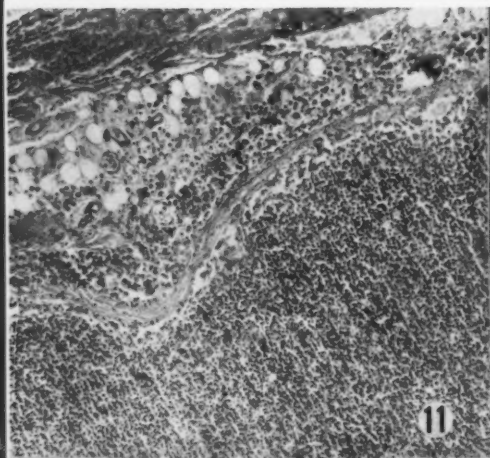
Fig. 7—Alkaline phosphatase stain of peripheral blood smear is negative as shown by lack of cobalt sulfide granules in cytoplasm of white blood cells, x 775.

Fig. 8—Alkaline phosphatase stain of bone marrow smear is negative as shown by lack of cobalt sulfide granules in the cytoplasm, x 775.

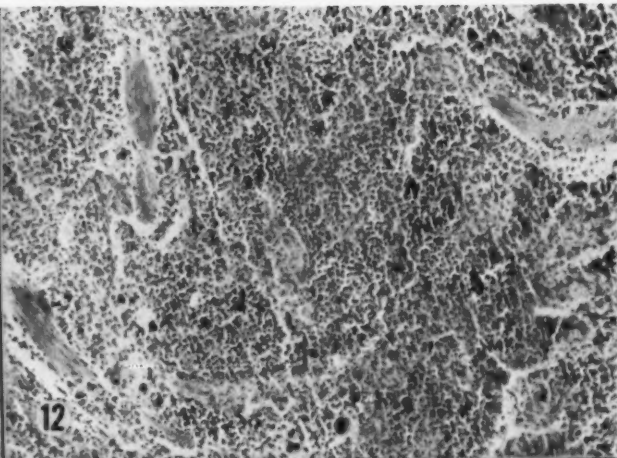
Fig. 9—Alkaline phosphatase stain of normal blood smear is positive as shown by the many cobalt sulfide granules in the cytoplasm of the neutrophils, x 775.

Fig. 10—Peroxidase stain on a frozen section of the liver shows many cells of the leukemic infiltration to be peroxidase positive, x 510.

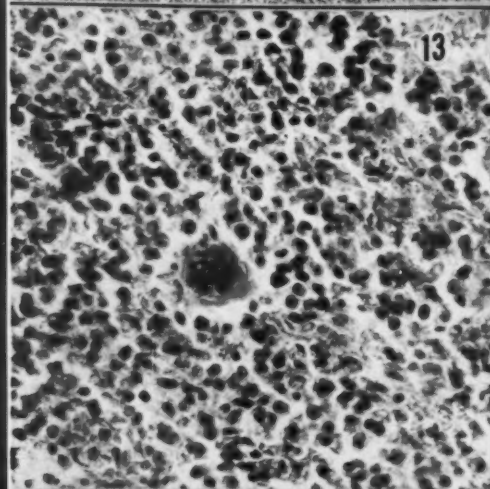




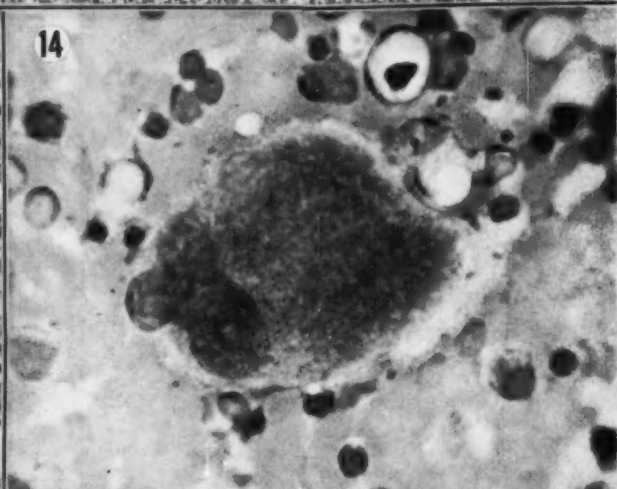
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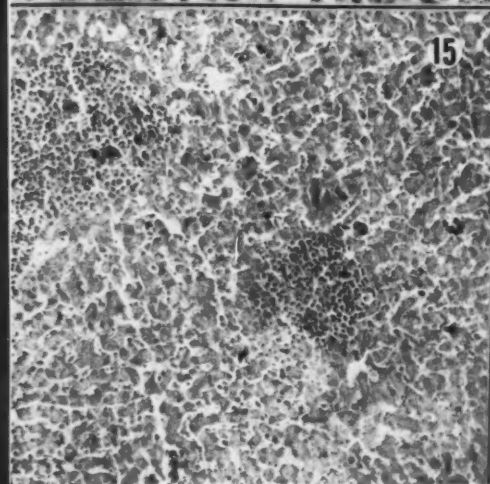
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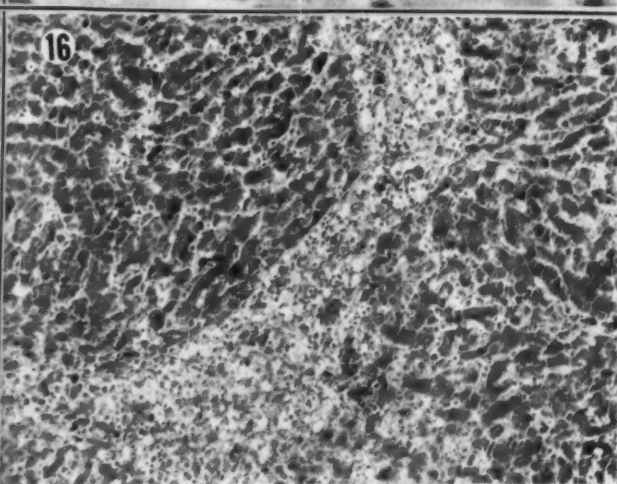
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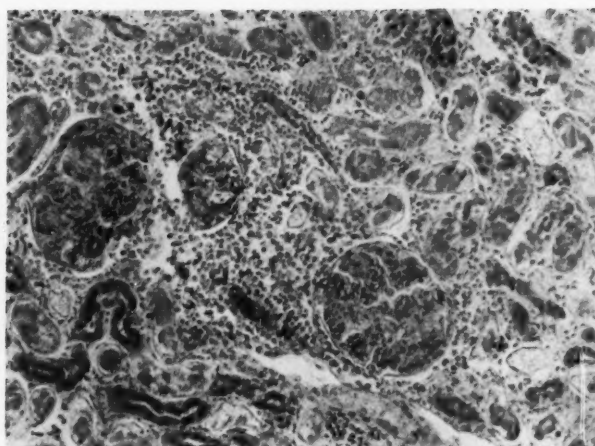


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Fig. 17—Leukemic infiltrates appear in the kidney. H and E, x 100.



cm. in diameter. The nodes were soft and pale gray on sections. The lungs were equal in size, weighed a total of 600 Gm., and showed dark brown and yellow mottling. The marrow of the long bones, sternum, iliac crest, ribs, and vertebral bodies was scant, light brown, and mushy. The spleen was surgically absent and the remainder of the organs showed no macroscopic lesions.

Microscopic examinations of the liver revealed leukemic infiltrations of the hepatic sinusoids and periportal spaces (fig. 16). The density of the infiltrate was markedly decreased when compared with the biopsy specimen obtained before irradiation. The bordering hepatic cells were atrophied. Leukemic infiltrates were also present in the peripelvic fat of the kidney and its interstice (fig. 17) and in the interstitial tissue of the prostate gland. The follicular pattern of the lymph nodes was distorted.

There were leukemic infiltrations of the perinodal fat, with the peripheral sinuses remaining patent (fig. 18). The bone marrow revealed hypocellularity of the erythroid and myeloid series (fig. 19). There was moderate pulmonary edema, without leukemic infiltration or infection (fig. 20). Microscopic examinations showed the remainder of the organs to be little changed. Death was attributed to lethal total body irradiation of a severely debilitated leukemic animal.

Discussion

The diagnosis of myelogenous leukemia was established on the basis of the findings of immature white blood cells, including blasts, in peripheral blood examinations. The bone marrow aspirations showed hy-

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Fig. 11—The follicular pattern of the lymph node is obscured by leukemic infiltrates, but the peripheral sinuses are patent. There is infiltration of perinodal fat. H and E, x 100.

Fig. 12—Spleen shows loss of follicular pattern and extramedullary hematopoiesis. H and E, x 100.

Fig. 13—Higher magnification of fig. 12. Megakaryocyte appears in center. H and E, x 600.

Fig. 14—Oil immersion photomicrograph of megakaryocyte in splenic imprint shows thrombocyte production. Wright's stain, x 900.

Fig. 15—Liver biopsy shows leukemic infiltrates in the periportal spaces and sinusoids. H and E, x 100.

Fig. 16—Liver after irradiation. Marked reduction of leukemic infiltrates appears, in portal spaces and sinusoids. H and E, x 100.

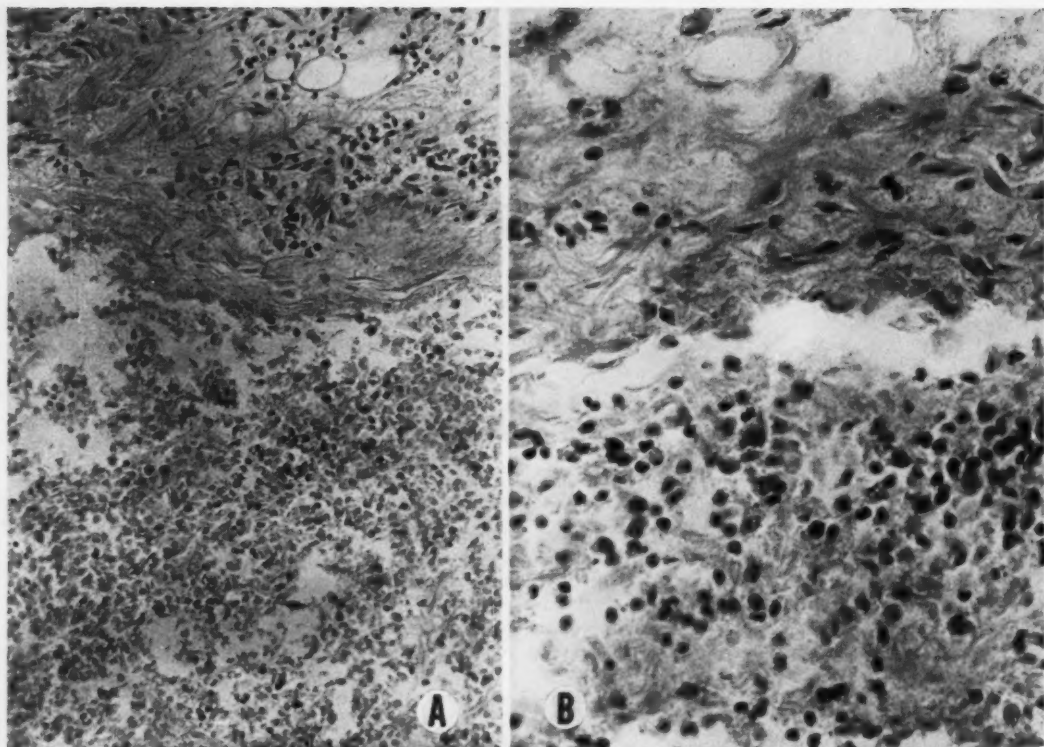


Fig. 18a—Lymph node after irradiation shows marked reduction of cellular infiltrates. H and E, x 400.

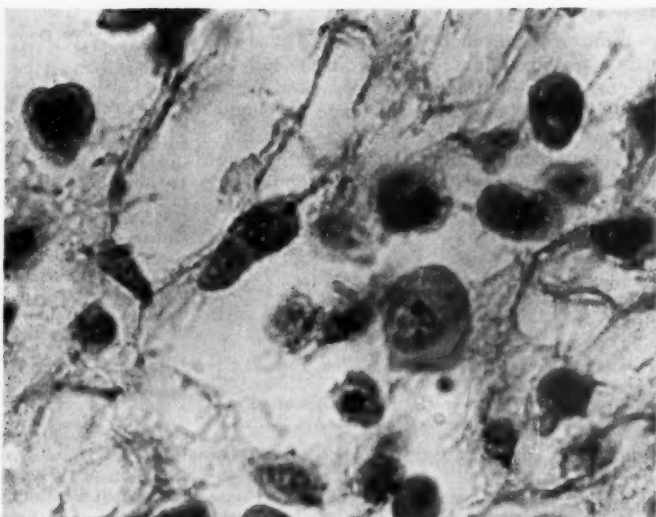
Fig. 18b—Higher magnification of figure 18a shows necrobiotic changes and nuclear debris. H and E, x 600.

percellularity with a marked hyperplasia of the myelogenous series. Many blast cells contained Auer's bodies. The occurrence of Auer's bodies in blast cells is pathognomonic for myelogenous leukemia.^{1,26} The positive peroxidase reaction seen in the immature and mature cells in the peripheral and bone marrow smears is diagnostic for the myelogenous nature of this leukemia as differentiated from a lymphatic form.

Another method recently described²⁵ was used to support the diagnosis of the myelogenous origin of the leukemia in this animal. This method is based upon the Gomori⁸ reaction of alkaline phosphatase present in normal myelogenous cells. This enzyme hydrolyzes P-nitrophenylphosphate. The liberated phosphate reacts with cobalt nitrate and ammonium hydrosulfide to

form dark granules of cobalt sulfide in the cytoplasm, obscuring the nuclear structure in many cells. The reaction was strongly positive in normal polymorphonuclear leukocytes and markedly increased in cells of the myelogenous series in leukemoid reactions. In normal individuals or those with leukemoid reactions, 90 per cent of the white blood cells are positive for alkaline phosphatase. On the other hand, less than 10 per cent of leukemic cells show this reaction. The cells in the peripheral and bone marrow smears in this dog were negative for alkaline phosphatase, thus supporting the diagnosis of leukemia and eliminating the possibility of leukemoid reaction. The possibility of leukemoid reaction in this case was also eliminated by the presence of infiltrations of immature myeloid cells, including blasts in the parenchymatous or-

Fig. 19—Bone marrow section 48 hours after irradiation, illustrates marked reduction of hematopoietic elements. H and E, x 900.



gans—a finding which does not occur in leukemoid reactions.^{1,18}

The comparison of the microscopic finding of tissues removed by biopsy with those obtained at necropsy revealed a striking diminution of the leukemic infiltrations. Such a change is not compatible with the natural course of leukemia and, therefore, should be attributed to the lethal dose of irradiation. The lymph nodes showed a lesser degree of leukemic infiltration of the perinodal fat, marked cytophagocytosis, and the presence of necrobiotic changes such as nuclear debris. Hypocellularity of the bone marrow and relative hypocellularity in the lymph nodes, with loss of the nodal architectural pattern and destruction of the germinal centers, were reported following irradiation of a dog with 800 r.⁶ The bone marrow showed a marked decrease in cellularity and presence of nuclear debris.

The changes in the microscopic structure of the liver were most striking. Heavy leukemic infiltrates seen in the periportal spaces and sinusoids had disappeared to a great extent following irradiation. Some periportal spaces were practically free of leukemic cells, leaving a mere framework of reticulum. Necrobiotic changes were pronounced in these areas, as reported by others.^{4,15} Irradiation did not abolish the peroxidase reaction of many of the remaining leukemic cells. The liver cells did not show any changes following irradiation.

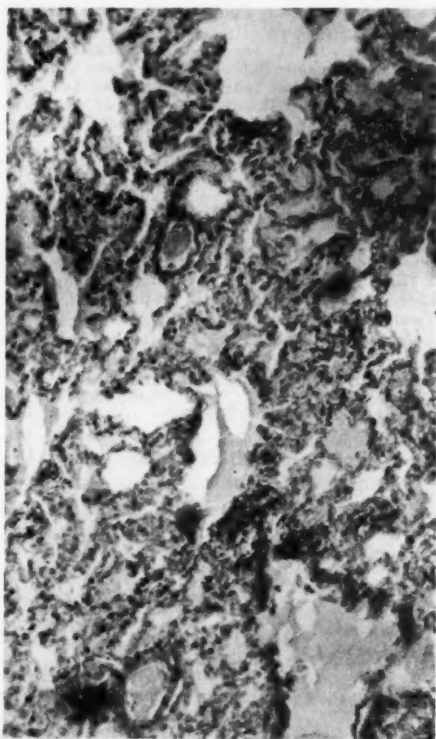


Fig. 20—Lung shows pulmonary edema and absence of inflammatory and leukemic infiltrates. H and E, x 100.

Summary

What is believed to be a proved case of acute myelogenous leukemia in a dog is discussed. Hematologic, biopsy, and necropsy studies show the leukemic myelogenous nature of this disease. Attention has been focused upon the histopathologic changes in the organs of this leukemic dog following total body irradiation with 600 roentgens.

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Fungus Causes Facial Eczema of Sheep

At a New Zealand research station, it was shown that sheep fed a spore-bearing fungus, *Sporidesmium bakeri*, developed facial eczema and extensive liver damage.

Freshly killed or freshly damaged pasture plants and short-clipped pasture were important factors in inducing a high spore count.—*Nature*, 184, (1959): 1327.

Infection in Bulls

Bruce O. BRODIE, D.V.M., M.S.

BOVINE TRICHOMONIASIS has been recognized as a cause of sterility and abortion in this country since 1932. Since breeding is the principal means by which trichomoniasis is transmitted, since 1 bull breeds many cows, and since the disease is largely self-limiting in cows, it is obvious that any effective control measure must be directed against the disease in bulls.

Many techniques have been described for the treatment of *Trichomonas*-infected bulls, but these treatments are laborious, time-consuming, expensive, and of uncertain outcome. The primary objective of this work was to explore the possibility of developing a less cumbersome and more effective treatment for trichomoniasis in bulls.

Herd history, together with the mucus-agglutination test,¹² may indicate the presence of trichomoniasis in a herd, but individual diagnosis must ultimately depend on microscopic examination for the presence of the motile organism, *Tritrichomonas foetus*. In bulls, trichomonads are found in greatest abundance in the area of the glans penis and the adjacent preputial mucosa.⁸

Three basically different methods have been developed for obtaining preputial material to be examined for *T. foetus*: (1) the swab method,¹⁷ (2) the douche or wash method (a) with suction bulb and cannula⁴ or (b) with gravity flow intravenous outfit,¹⁶ and (3) the pipette method.^{7,8}

The douche method is more efficacious than the pipette and swab methods.⁴ Except in cases where the trichomonad population

of the prepuce is very low, the pipette method is nearly as effective as the douche method. The swab method is definitely inferior to the other two.

The preputial materials may be examined directly under the microscope or they may be used to inoculate culture mediums for later examination. It has been established that the use of both direct and cultural methods reveals motile trichomonads in 90 per cent of the samples collected by the douche method from bulls known to be infected.⁵

Many culture mediums have been reported to support growth of *T. foetus*.¹⁷ A simple and satisfactory culture medium consists of commercial thioglycollate broth, 10 per cent horse serum and antibiotics (200 to 500 units of penicillin and 1 to 2 mg. of streptomycin/ml.) to prevent bacterial overgrowth. (Cysteine-peptone-liver infusion-maltose-serum agar is another culture medium well suited to laboratory work with trichomonads.¹¹)

In the United States, there was no recognized specific treatment for trichomoniasis in bulls prior to 1946.¹⁷

In 1948, the successful use of Bovoflavine ointment* was reported.² This proprietary product had been used in Germany for about 10 years. The treatment procedure with Bovoflavine entailed: (1) heavy epidural anesthesia; (2) withdrawing the penis and rubbing the ointment into the penile and preputial mucosa for 20 minutes; and (3) a urethral douche of 15 to 20 cc. of 0.1 per cent trypanflavine. A

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The assistance of Dr. L. E. Boley, Department of Veterinary Clinical Medicine, and Dr. N. D. Levine, Department of Veterinary Pathology and Hygiene, is gratefully acknowledged.

*Bovoflavine ointment is a German proprietary product available in 80- and 250-Gm. tubes. According to the manufacturer, Bovoflavine ointment consists of 3:6-diamino-10 methylacridinium chloride plus 3:6 diamino-acridine monohydrochloride [Trypanflavine] and bis-(2-methyl-4-aminoquinolyl-6)-carbamide hydrochloride [Surfen] in a fat-free ointment base.

second similar application 10 to 14 days later completed 1 treatment. Since 1953, a variation of this treatment procedure has replaced step 1. The bull remains standing and the retractor penis muscles are relaxed by blocking the internal pudendal nerves.¹³

Other treatments are used in Europe. Three per cent hydrogen peroxide sprayed into the sheath at nozzle pressures of 140 to 150 lb. per square inch is used for treating *Trichomonas*-infected bulls. Silver nitrate is used to cauterize the penile and preputial mucosa.⁶

Many chemical compounds have been tested *in vitro* for trichomonocidal activity. Many chemicals kill *T. foetus* at very low concentrations, but prove ineffective for treating trichomoniasis in bulls.¹⁸ The method of application and the vehicle used are important factors in the penetration and consequent success of any treatment for trichomoniasis.² All local treatments used successfully seems to produce a moderate surface inflammatory reaction.

Filipin,* an antibiotic substance produced by *Streptomyces filipinensis*¹ has been shown to be trichomonocidal *in vitro* in dilutions as low as 50 µg./ml.¹⁴

Trichomycin,** a substance produced by *Streptomyces hachijoensis* is reported to be highly effective for the treatment of trichomoniasis in both men and women.¹⁵

Chlorhexidine ointment (1%)† was used with apparent success on 3 cases of trichomoniasis⁹ in bulls. Penile erection was produced with an electric ejaculator.

One interesting side effect of the ataractic drugs is their relaxation of the retractor penis muscles in stallions and bulls.¹⁹ Nothing in the literature indicates that the ataractic drugs have been used to relax the retractor muscles of the penis for treating trichomoniasis.

Materials and Methods

Six bulls (A, B, L, R, S, and T) were found to be naturally infected with *T. foetus* during routine testing at the large

animal clinic, College of Veterinary Medicine, University of Illinois, Urbana.

Four basically different approaches to application of medication to the penile and preputial mucosa were used:

1) *Intrasheath Approach*.—A preputial applicator, about 2½ ft. long, was devised from a styrene rod fitted into a slightly shorter length of styrene tubing. This applicator proved convenient for depositing pills or ointments high in the preputial cavity. Ointments were rubbed into the penis by massage from the outside of the prepuce.

2) *Electric Ejaculator Approach*.—The electric ejaculator was used to produce erection of the penis. The medicament was rubbed vigorously into the penile and preputial mucosa for the duration of the erection (2 to 4 minutes).

3) *Pudendal Nerve Block Approach*.—Pudendal nerve block was used to cause relaxation of the retractor penis muscle and consequent exposure of the penis. The medicament was vigorously rubbed into the penile and preputial mucosa for 20 minutes. In some cases, epidural anesthesia was used to augment relaxation of the penis.

4) *Tranquilizer Approach*.—Promazine hydrochloride‡ was used in doses of 200 to 1,000 mg. intravenously to expose the penile and preputial mucosa for treatment. Except where otherwise stated, the medicament was rubbed in thoroughly for 20 minutes. In some cases, epidural anesthesia was used to augment relaxation of the penis.

Four different drugs were administered:

1) *Filipin*.—A powdered form of filipin was obtained and mixed 1:100 in hydrophilic ointment base, USP. Uniform dispersal was accomplished by hand mixing and by the use of a Waring Blendor. Filipin was applied by the intrasheath approach to bulls B, L, S, and T. Bulls L, S, and T were treated with the aid of the electric ejaculator.

2) *Trichomycin*.—Two forms of trichomycin are available commercially.

(a) Effervescent tablets intended for human intravaginal use—each tablet contained 50,000 units each of trichomycin and penicillin. The tablets were placed in the sheath. Bull A was treated 4 times using 3 tablets per treatment and 2 times using 4 tablets per treatment. Bull S was treated once with 5 tablets. Bull L was treated twice, once with 5 tablets, once with 6.

(b) Eighteen Gm. of trichomycin ointment (1,800,000 units) were rubbed into the mucosa of the penis and prepuce of bull A for 20 minutes following pudendal block; 6 Gm. (600,000 units) was used on each of 2 Bulls, L and S. The electric ejaculator was used to extrude the penis for treatment.

3) *Chlorhexidine*.—One per cent chlorhexidine ointment was used with the electric ejaculator approach only. Bulls S and T were given 3 treatments

*Filipin was furnished by the Upjohn Co., Kalamazoo, Mich.

**Trichomycin is produced by the Sanyo Chemical Co. LTD., Nagoya, Japan.

†Nolvasan ointment, produced by Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

‡Sparine is produced by Wyeth Laboratories, Inc., Philadelphia, Pa.

TABLE 1—Summary of Methods of Treatment of Bulls Infected with *T. Foetus*

Agent used	Filipin		Trichomycin			Chlorhexidine	Bovoflavine				
	Intra-sheath	Elec. ejac.	Tablets	Ointment			Elec. ejac.	Nerve block	Elec. ejac.	Promaz. 4 min.	Promaz. 20 min.
Method Used											
Bulls											
R	.....	.....	.....	.....	.....	.....	2*	.....	.....	.....
S	3	2	1	1	.....	3	.....	4	1	2*
A	.....	.....	6	.....	1	.....	2*	.....	.....	.....
B	1	.....	1	.....	.....	5	.....	2*	.....	.....
L	2	3	2	1	.....	5	.....	4	1	2*
T	1	2	2	.....	.....	3	.....	4	.....	2*

Numbers indicate times medicated; *Bull recovered.

48 hours apart. Bull B was treated twice 24 hours apart with the difference that the penis was washed thoroughly with an antiseptic solution* before the chlorhexidine ointment was applied. Bull B received 3 other treatments without the preparatory wash. Bull L was treated once with a preparatory wash and 4 times with chlorhexidine ointment only.

4) *Bovoflavine*.—Bovoflavine ointment used with the pudendal nerve block and rubbed into the penis for 20 minutes is the "standard" treatment for trichomoniasis in bulls in the United States.

Bovoflavine was used with the electric ejaculator method on 4 bulls. About 80 Gm. of the ointment was rubbed in for 2 to 4 minutes in each treatment. Bull B was treated twice 9 days apart. Ten routine tests were made at approximately weekly intervals. Bull B was then bred to an uninfected heifer. Bulls L, S, and T were treated twice in this manner and tested. Two more treatments and testing followed later.

Bulls A and R were given 2 "standard" 20-minute treatments about a week apart. Suitable tests followed. Bulls L, S, and T were each treated twice about 10 days apart, with promazine hydrochloride used to relax the retractor penis muscles. About 125 Gm. of Bovoflavine was used per 20-minute treatment. In each case, the urethra was douched with 30 ml. of 1:1,000 acriflavine.

In the ensuing 16 weeks, bulls L, S, and T were tested 13 times. At the twelfth week, bull T bred a cow that was free of trichomoniasis. At the fourteenth week, bull L bred another cow which was also *Trichomonas* free. Bull S was unable to mount a cow because of an old pelvic injury. An electric ejaculator was used to obtain a 4-ml. ejaculum. The entire ejaculum was deposited in the vagina of a 6-month-old heifer. All 3 females were tested twice for trichomoniasis between the tenth and eighteenth days after exposure.

5) *Testing on Completion of Each Treatment*.—All tests of bulls and cows were by the pipette method using direct and cultural examinations. Thioglycolate mediums or CPLM were used.

*Havosept is produced by Haver-Lockhart Laboratories, Kansas City, Mo.

Results and Discussions

The results are tabulated (table 1).

All treatments involving the introduction of compounds into the sheath failed.

Only the electric ejaculator approach produced an erection. It was thought that with the penis erect and the crypts of the mucous membrane open, medicament might penetrate as much in a 2- to 4-minute rub as in a 20-minute rub on a non-erect organ. This approach may have some merit, since when combined with Bovoflavine it was effective on 1 bull (B) and 3 other bulls so treated remained negative for several weeks.

The pudendal nerve block did not always produce optimum relaxation of the penis; however, with some manipulation, it was always possible to apply the medicament for 20 minutes. In several cases, epidural anesthesia was used to augment the pudendal block. Two "standard" treatments with Bovoflavine produced recoveries in 2 bulls.

Promazine hydrochloride facilitated handling the bull in all cases. There was much variation in individual response with regard to relaxation of the penis. Doses of 200 to 350 mg., given intravenously, were as effective as larger doses. Ideal relaxation was produced in 10 to 15 minutes in some bulls. In the 1,440-lb. bull (S), 200 mg. of promazine hydrochloride intravenously produced optimum exposure of the penis.

In the 1,920-lb. animal (L) 350 mg. produced only sufficient relaxation to permit treatment with considerable effort. When 1,000 mg. of promazine and 30 ml. of 2 per cent procaine epidurally were used, no

additional relaxation of the penis was produced and the bull was unable to stand. Other bulls were between these extremes in their response to promazine. Three bulls remained negative for *T. foetus* following promazine exposure and Bovoflavine application for 20 minutes.

The results of 71 treatments using 4 different drugs, follow.

1) *Filipin*.—Bulls B, L, S, and T did not respond to treatment when 1 per cent filipin ointment was used with the intrasheath and electric ejaculator approaches.

2) *Trichomycin*.—(a) Bulls A, B, L, S, and T did not respond to treatment when effervescent tablets of trichomycin and penicillin were introduced into their sheaths. Foam poured from the preputial orifice for several minutes following the treatments. (b) Bulls A, L, and S did not respond to treatment with trichomycin ointment.

3) *Chlorhexidine*.—Bulls B, L, and T did not respond to treatment with chlorhexidine.

4) *Bovoflavine*.—Bull B, treated twice with Bovoflavine with the electric ejaculator approach, was negative after the first treatment and remained negative through 10 weekly tests. The heifer bred by bull B did not develop signs of trichomoniasis. Vaginal mucous collected 2 and 3 weeks after breeding did not contain trichomonads. Conception resulted from this breeding and this heifer calved normally. In bulls L, S, and T, 2 electric ejaculator-Bovoflavine treatments, 48 hours apart, resulted in negative preputial samples for 2 to 4 weeks. Almost invariably the first positive sample could be identified by culture only.

In bulls A and R, no trichomonads were found in 6 weekly preputial samples following conventional treatment. Both bulls were released for breeding purposes and neither owner has reported breeding difficulty with these animals.

Bulls L, S, and T recovered after 2, 20-minute Bovoflavine-tranquilizer treatments. Each of the 3 bulls remained negative for 13 direct and cultural examinations covering a period of 4 months. No trichomonads were found in the samples taken from the 3 females bred by these bulls.

Summary

Four drugs were used in 71 treatments of 6 bulls infected with *Trichomonas foetus*. No treatment using filipin, trichomycin, or chlorhexidine was successful. Six bulls were successfully treated with Bovoflavine ointment. Two bulls recovered after a series of 2 "standard" 20-minute treatments following pudendal nerve block. One bull recovered after a series of 2, 4-minute applications using the electric ejaculator to expose the penis. Three bulls re-

covered after a series of 2, 20-minute applications using promazine hydrochloride to relax the retractor penis muscles. The last method has 2 advantages over the pudendal nerve block — ease of administration and quieting effect.

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Fringed Tapeworms from Feedlot Lambs

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A REVIEW of treatments of *Thysanosoma actinioides* (fringed tapeworm) infection indicated 2-2'dihydroxy-5, 5'dichlorodiphenyl methane* was the most effective thysanosomicide in use.⁶ However, its action was variable and treatment of infected lambs was not economically justifiable for salvage of livers alone.

Hygromycin B** is an antibiotic which has anthelmintic action against *Ascaris suum* of pigs^{1,3,5,7} and other parasites.^{2,4} It has low toxicity and enhances growth of swine.⁵ Because of these factors, it was deemed advisable to evaluate hygromycin B as an anthelmintic in feedlot lambs.

Materials and Methods

Hygromycin B was incorporated into the ration of feedlot lambs for 2 consecutive feeding periods (1957-1958 and 1958-1959 seasons).

The 1957-1958 group consisted of 300 Columbia-Rambouillet lambs which came from a ranch south of Gillette, Wyo., and averaged 70 lb. each when placed on trial Nov. 21, 1957.

Hygromycin B was added to the ration 15 days after the lambs were placed in lots and started on feed. Four tenths (0.4) of 1

lb. of a premix,† containing 0.96 Gm. of hygromycin B, was added to 5 lb. of soybean oil meal to make the daily treatment for 50 lambs. Thus, the lambs each received a daily average of 0.008 lb. of premix which contained 19.2 mg. of hygromycin B.

The lambs were fed 3 different rations:

Ration 1.—This ration consisted of a grain mixture (equal parts corn and sugar beet pellets), soybean oil meal, alfalfa hay, and free choice beet-top silage.

Ration 2.—This was the same as ration 1 except corn silage replaced beet-top silage.

Ration 3.—This ration was the same as ration 1 except that alfalfa silage replaced beet-top silage.

Lambs were weighed monthly. After a 98-day feeding period, they were slaughtered and the livers were examined by usual meat inspection methods; those containing tapeworms were recorded. Viscera were collected from 12 treated and 9 untreated lambs. These were examined by the usual parasitologic methods, and the numbers of strongylate worms and fringed tapeworms were recorded.

The 1958-1959 study was similar to the 1957-1958 study except that hygromycin B was fed for varying intervals during the feeding period. It utilized 200 Columbia-Rambouillet range lambs from a ranch northwest of Gillette, Wyo. They averaged 68 lb. each when placed in feedlots on Nov. 10, 1958.

The lambs were fed hygromycin B at the same level and in the same manner as in the preceding year. The lambs were allotted to experimental lots of 50 each and all were fed a ration consisting of a grain mixture

This article was published with the approval of the director of the Nebraska Agricultural Experiment Station as paper No. 980.

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*Marketed as Tienitol by Pitman Moore Co., Indianapolis, Ind.

**Fermentation product of *Streptomyces hygroscopicus*, marketed by Eli Lilly Co., Indianapolis, Ind.

†Hygromix, a premix, which contains 2.4 Gm. of hygromycin B per pound, manufactured by Eli Lilly & Co., Indianapolis, Ind.

TABLE 1—Livers Condemned Because of Tapeworm Infections in 3 Groups of Lambs Treated with 19.2 mg. of Hygromycin B per Lamb Daily, and Average Total Gain of Lambs Over the 90-Day Feeding Period During the 1957-1958 Trial

	Hygromycin B					
	Treated lots			Untreated lots		
	1	2	3	1	2	3
No. lambs examined	49	48	50	49	45	49
No. lambs with worms in liver	7	1	5	20	21	24
Lambs with worms in liver (%)	14.28	2.08	10.00	40.82	46.66	48.98
Ave. total gain (lb.)	41.3	43.5*	40.1*	38.8	38.5	36.0

*Significant at 5 per cent level (analysis of variance).
Rations were: lot 1—beet top silage; lot 2—corn silage; and lot 3—alfalfa silage as the major source of roughage.

(equal parts corn and beet-pulp pellets), soybean oil meal, alfalfa hay, and free choice corn silage. Lot 1 served as untreated controls; lot 2 received hygromycin for 30 days; lot 3 received hygromycin for 60 days; and lot 4 received hygromycin for 90 days.

TABLE 2—Average Total Gain per Lamb in the 1958-1959 Trial During Which 3 Lots of Lambs Were Fed 19.2 mg. of Hygromycin Daily

	Control ^a	Fed hygromycin B for		
		30 days	60 days	90 days
Av. total gain (lb.)	27.37	29.81	31.42*	32.55*

^aReceived no hygromycin. *Significant at 5 per cent level (analysis of variance).

Weight gains were measured, and lambs were examined for tapeworms as in the 1957-1958 trial. In addition to the usual examination of livers for tapeworms, the anterior 5 ft. of small intestines from each of 70 lambs was examined to check the degree of correlation between presence of tapeworms in the liver and in the intestine.

Results

In the 1957-1958 control lambs, 45 per cent of the livers contained *T. actinioides*. In the treated groups, 9 per cent of the livers contained tapeworms. Degrees of in-

fection within the 3 different ration groups were tabulated (table 1). *Thysanosoma actinioides* was found in 2 of the 12 small intestines examined from treated lambs and in 4 of the 9 intestines from untreated lambs. Both treated and untreated lambs had low level infections with *Haemonchus contortus*, *Ostertagia circumcincta*, *Trichostrongylus colubriformis*, *Trichostrongylus axei*, *Nematodirus spathiger*, and *Cooperia punctata*.

The 1958-1959 trial indicated that hygromycin B, at 19.2 mg. per lamb daily, was nearly as effective in removing fringed tapeworms when fed 30 days as when fed 60 or 90 days. In the control lambs, 51 per cent of the livers contained fringed tapeworms at slaughter. The rate of liver infection was 8, 2, and 4 per cent for those lambs fed 30, 60, and 90 days, respectively.

Fringed tapeworms were present in both the liver and intestine in 20 of 70 specimens examined. They were present in neither the liver nor intestine in 44 lambs, in the intestine but not in the liver in 5, and in the liver but not in the intestine in only 1. Thus, the liver-intestine findings agreed in 64 of the 70 observations, making the liver observations a valid indication of the incidence of *T. actinioides*.

Average total gain of lambs was determined (tables 1 and 2). Generally, lambs receiving hygromycin gained more than untreated lambs during the feeding period.

Discussion

Treatment with hygromycin B is probably not economically justified by salvage of livers alone but, when added gain resulting from treatment is concerned, the operation becomes profitable. Value of lamb livers has been estimated at 40 cents each.⁶ Treatment of lambs with hygromycin B for 30 days reduced liver condemnation due to tapeworm infection from 45 to 9 per cent. Thus, untreated lambs resulted in a loss of \$18.00/100 animals to the packer. Treated lambs resulted in a loss of \$3.60/100 animals, which represents a saving of \$14.40/100 lambs over untreated ones. Average cost of premix is 50 cents per pound. At this cost, and at a consumption rate of 0.008 lb. daily, medication cost \$12.00/100 lambs for the 30-day period, \$2.40 less than the salvage value of the extra livers. In

addition to this saving for the packer, the hygromycin-treated lambs gained approximately 2 lb. more than the untreated lambs.

Summary and Conclusions

Hygromycin B mixed with the ration and fed at the daily rate of 19.2 mg. per lamb reduced parasitism with fringed tapeworm in 2 feeding trials.

Parasitism in the 1957-1958 lambs was reduced from 45 per cent in the untreated lambs to 9 per cent in the treated lambs. Of the untreated lambs in the 1958-1959 feeding period, 51 per cent were infected with *Thysanosoma actinioides*; 5 per cent of the treated lambs in this group were infected. The drug effectively reduced parasitism when fed for 30 days.

Lambs fed hygromycin gained faster than untreated lambs. It was concluded that treatment was economically justifiable since it reduced liver condemnation and enhanced growth.

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Livestock Values Down from Year Ago

Inventory value of all livestock and poultry on farms and ranches January 1 was 16.2 billion dollars, down 10 per cent from a year earlier. Average value per head of all cattle was down 11 per cent; milk cows, down 5 per cent; hogs, down 42 per cent; stock sheep, down 19 per cent; and horses and mules, up 11 per cent. The average value of chickens was down 17 per cent, and turkeys, up 6 per cent from a year earlier.

Cattle on Jan. 1, 1960, were valued at \$136 per head, compared with \$153 a year earlier, \$119 in 1958, and \$120 for the 1949 to 1958 average.

Milk cows, 2 years old or older, were valued at \$208, compared with \$219 a year earlier, \$176 in 1958, and \$179 for the 10-year average.

Hogs were valued at \$18.50, compared with \$32 a year earlier, \$30.20 in 1958, and \$29.40 for the 10-year average. Stock sheep were valued at \$16.50 per head, compared with \$20.30 a year ago, \$19.40 in 1958, and \$18.20 for the 10-year average.—*Statistical Summary, Agric. Market Serv., USDA, Feb., 1960.*

Removal of Lungworms

from Naturally Infected Sheep

Helen E. JORDAN, D.V.M., M.S.

IN RECENT YEARS cyanacethydrazide* has been introduced for specific treatment of lungworms.^{8,9} Experimental and field trials with this drug in the United States have been conducted mainly with cattle and swine.^{1,2,4,5,7} The project reported in this paper involves the efficacy and clinical response of cyanacethydrazide in naturally infected sheep.

Materials and Methods

From 2 naturally infected flocks, 40 sheep were selected, which had clinical signs of lungworms and a history of death losses with subsequent findings at necropsy of the parasite *Dictyocaulus filaria*. All sheep selected for tests were shedding larvae in the feces prior to treatment. Ages varied from 6 months to 3 years, but coughing, dyspnea, and general unthriftiness were just as severe in adults as in young; therefore, both age groups were used.

The sheep were allotted to 4 test groups. One group was treated with oral cyanacethydrazide, 1 with a single subcutaneous injection, another by subcutaneous injection on 3 successive days, and 1 group was kept for controls. Cyanacethydrazide was given according to the manufacturer's recommendations, each injection given at the rate of 250 mg./35 lb. of body weight. The sheep were weighed prior to treatment and 7 days afterward, at which time they were killed and their lungs examined for lungworms.

Dr. Jordan is associated with the Department of Pathology and Parasitology, School of Veterinary Medicine, University of Georgia, Athens.

Research was supported in part by Fort Dodge Laboratories.

*Cyanacethydrazide used in this experiment was Dictyicide, marketed by Fort Dodge Laboratories, Fort Dodge, Iowa.

Field studies were conducted with the remaining sheep from these 2 flocks and 2 additional flocks, using only injectable cyanacethydrazide. Approximately 10 per cent of each flock was left untreated for controls.

RESULTS

Controlled Evaluation

Sheep that were given cyanacethydrazide for 3 successive days harbored fewer adult lungworms 7 days after treatment than any of the other groups. The untreated controls averaged more lungworms than any of the treated groups. The percentage of worms removed was calculated by comparing the number of worms remaining in the various treated groups to those recovered from the control group. Average number of worms from each sheep, range for each test group, and apparent percentage efficacy for each type of treatment used was determined (table 1).

The weight variance between treated and controls for the first post-treatment week was not significant.

Field Studies

Flock 1—March, 1958.—This flock was composed of 379 sheep consisting of 125 ewes, 46 fall lambs, and 208 feeder lambs. All fall lambs were given 1 injection of cyanacethydrazide. One hundred ewes and 122 feeder lambs were given 3 injections, the former at 1-, 7-, and 21-day intervals, and the latter on 3 successive days. The remaining 111 animals were not treated and served as controls. Weights were recorded for feeder lambs only. Three weeks

TABLE 1—Efficacy of Cyanacethydrazide in Removing Lungworms from Naturally Infected Sheep

Cyanacethydrazide treatment	No. animals	Av. no. worms	Range no. worms	Apparent efficacy (%)
3 consecutive days, subcutaneously	12	2.0	0-9	92.4
Once, subcutaneously	10	3.5	0-21	86.7
Once, orally	8	6.0	0-15	77.3
Controls, none	10	26.4	2-158	.....

after injection, the treated group had gained 25 per cent more weight than the controls (table 2). Although weight records were not kept on the ewes, their general improvement appeared most pronounced of all the groups. The apparent weight gains were detected in the process of handling the ewes for the 21-day treatment.

Clinical observations before treatment showed that both young and adult sheep were unthrifty in condition; some were debilitated, and all had a dry cough. No record of losses was kept, but there were some deaths during the past 3 months, 6 of which were attributed to lungworms in the previous month.

After treatment, the cessation of coughing was dramatic. It stopped in the majority of sheep within 48 hours. In the group in which sheep were given a single injection only a few were coughing 6 months later. The untreated sheep were still coughing and unthrifty at the end of the 6-month observation period.

Flock 2—May, 1958.—The acute stage and greatest losses occurred in January and February in this flock. Losses had subsided by May, when the flock was first seen by the author, but the remaining 100 ewes were still coughing and unthrifty. The 50 spring lambs were beginning to show clinical signs of lungworms; this was later confirmed by laboratory findings.

At 1-, 7-, and 21-day intervals, 135 sheep were treated and 15 were kept as controls. Coughing in the treated group had stopped completely after 7 days but persisted in the untreated sheep. Weight records were not available but, from observations, the treated sheep appeared to have gained more weight than the controls. Their general condition also seemed to have improved. The improvement, in this case, was marked enough that the owner, who previously was going to sell the entire flock, decided to keep them.

Flock 3—July, 1958.—This flock was

composed of 88 ewes all showing marked signs of parasitism. They had been treated for intestinal parasites without improvement. Losses had averaged 1 a day for the month prior to treatment. Seventy-eight sheep were given injectable cyanacethydrazide at 1-, 7-, and 21-day intervals and the remaining 10 were not treated. Subsequent to treatment, deaths ceased in the treated sheep but 4 of 10 sheep in the control group died. Coughing ceased in 2 days in the treated sheep. Over-all improvement was apparent in the test group but not in the controls.

Flock 4—July, 1958.—The 205 animals in this flock were lambs. They were fed a good quality ration and had been repeatedly treated for intestinal parasites but coughing persisted and approximately half the lambs appeared unthrifty. Laboratory findings confirmed presence of lungworms. Part of these lambs were offspring from flock 3. The ewes of flocks 3 and 4 originated from the same source.

Treatment was given at 1-, 7-, and 21-day intervals to 195 lambs, and 10 were

TABLE 2—Weight Gains in Lungworm-Infected Feeder Lambs

Test group	No. animals	Initial weight	Wt. 3 wk. after treatment	Av. wt. gain/day
*CAH	122	73.5 lb.	82.8 lb.	0.44 lb.
Controls	86	73.7 lb.	80.7 lb.	0.33 lb.

*Cyanacethydrazide, given subcutaneously for 3 consecutive days.

kept for controls. Three controls and 2 treated lambs died after the first injection was given, but no deaths occurred thereafter. Noticeable improvement could be detected in the treated group while coughing persisted in untreated animals.

Discussion

Cyanacethydrazide appeared to be effective in producing a substantial reduction of lungworms in sheep harboring medium to relatively low numbers of these parasites. Injectable administration appeared to be effective in reducing the parasite infection.

A total of 827 naturally infected sheep, including young and adults, were treated

with injectable cyanacethydrazide. Coughing ceased in 2 or 3 days and the general appearance of the sheep improved noticeably within 2 to 3 weeks. Unfortunately, weight records could not be kept except for 1 flock, but weight increases in favor of the treated sheep could be detected in handling the animals 21 days after treatment. In the weighed flock, the gain was slightly greater in treated lambs compared with the controls. The sheep were maintained on the same pastures, and similar care was given to all groups so that the main variable was treatment. The return of treated ewes to good condition was much faster than would be expected even though the lambs had just been weaned. Coughing and nasal discharge ceased in treated ewes but persisted in the controls.

From observations made in this study, it appears that in sheep maintained under poor husbandry conditions relatively few worms will perpetuate clinical signs, and riddance of these few may help considerably in alleviating unthrifty conditions. This supposition is at least partially substantiated by the field trials conducted on naturally infected flocks reported herein.

Although sheep used in this study had been known to be infected with lungworms for 3 months in some flocks and 6 months in others, the majority in all 4 flocks were showing clinical signs of lungworms and unthriftiness. According to some workers, these parasites are naturally eliminated in 56 to 103 days, and the animal recovers with some degree of resistance to further infections.^{3,6} Under good field conditions, where repeated exposure is low and plenty of good quality feed is available, natural elimination and immunity is probably the usual course. But under adverse field conditions, as existed in this study, sheep apparently do not make this recovery, and the infection becomes chronic. These sheep were continually picking up many larvae which could be found by histologic examination of the lungs. Even though the majority of sheep examined were harboring relatively few worms, there was a high percentage of pulmonary abscesses in the 40 sheep necropsied. On histologic examination, there was evidence of continuing pathologic changes around bronchi and bronchioles. It is suggested, therefore, that under adverse field conditions such as were present when most of these animals were tested, resolution of pneumonia and subse-

quent immunity did not occur. Instead, the few worms present, along with continually developing larvae, perpetuated a low grade pneumonia resulting in an unthrifty animal. The cases studied in this report indicate that, under certain field conditions, sheep are not as able to develop immunity and recover from lungworm infection as is generally assumed.

Summary

1) The efficacy of cyanacethydrazide was tested in 42 naturally infected sheep harboring relatively few lungworms, but still showing typical clinical signs of lungworm infection. Cyanacethydrazide was effective in reducing the number of worms; the best results were obtained with 3 subcutaneous injections at 24-hour intervals rather than with single oral or subcutaneous dosage.

2) Field trials were conducted in 4 flocks of sheep totaling 827 animals. In treated sheep, the persistent cough which had been observed 3 to 6 months prior to treatment was alleviated.

3) Weight gains in treated lambs, in the 1 flock checked, were slightly greater than the controls 3 weeks after treatment.

4) Death losses from lungworm disease ceased in 2 flocks after treatment with cyanacethydrazide.

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Editorial

Revised Criteria for Ads in AVMA Journals

The Council on Biological and Therapeutic Agents, which came into being under the new constitution in 1958, has accepted the responsibility for reviewing advertisements submitted for publication in AVMA journals.

Under the new program of screening, advertisements must meet the following criteria:

1) Advertisements for a new product will not be considered by the AVMA publications until a license has been obtained from the Agricultural Research Service (for biological products) or until a new drug application (for drugs) has become effective. Advertisements for products or devices not regulated by the government will be accepted at the discretion of the Council.

2) The product and the advertising must be identified. For drugs, the full generic or chemical name of each active ingredient must be shown in 6 point or larger type. [This is a sample of 6-point type]. For biological products, the true name must be shown in 6 point or larger type. The generic, chemical, or true name must be used in connection with or adjacent to the trade name of the product.

3) Advertisements shall not be misleading or deceptive.

4) Advertisements containing statements or inferences that the advertiser is unable to substantiate will not be accepted.

5) Samples or copies of the label and package insert (when used) must accompany new advertisements for the product.

Advertisements for the Journals are normally given preliminary screening by the advertising manager. When new products or uses are involved, or when questions of acceptability arise, the copy will be sent to the Council's staff consultant, who will ask the Food and Drug Administration or the Agricultural Research Service if the product has been authorized for sale. At this point, he may also ask the advertiser to substantiate claims or inferences made in the copy. If the advertisement is obviously acceptable or unacceptable, the staff consultant will recommend its acceptance or rejection.

When objections to ads do not clearly indicate immediate rejection, the staff consultant may authorize its conditional acceptance for scheduled publication pending final disposition by the Council. In this event, the advertisement will be submitted to the Council's Committee on Advertising, which will rule on its acceptability after obtaining advice from any consultants the Committee may deem helpful.

There is little doubt that JOURNAL readers will wholeheartedly approve this program of screening ads. Manufacturers, too, should approve. After all, a professionally screened ad should be worth far more than one prepared in such a manner that its contents tax the credulity of the reader or even arouse his animosity.

Disposition of Biological Products in the U. S.

Of the 4,282,245,747 doses of all biological products produced in licensed establishments during 1959, more than 90 per cent were produced for use in poultry diseases. About 3 out of every 4 doses produced were for Newcastle disease alone. Of the half billion doses produced for use in other diseases, hog cholera vaccines accounted for 43 million doses; swine erysipelas vaccines, 41 million doses; clostridial products, 47 million doses; Brucella vaccines, 9 million doses; leptospirosis products, 14 million doses; rabies vaccines, 7 million doses; and canine distemper-hepatitis vaccines, 3 million doses. Bacterins of all types accounted for 128 million doses; diagnostic agents, 72 million doses (tests); and toxoids, 3 million doses.—*USDA Biological Products Notice No. 74, March 1, 1960.*

Colonial Morphology of Leptospires

An intensive study of the colonial growth of 16 serotypes of leptospire has been carried out, employing the solid medium of Cox and Larson. The original medium was modified by including cycloheximide to inhibit fungal contaminants. Some of the colonies such as *Leptospira semerang*, *Leptospira andaman*, and *Leptospira biflexa* were distinctly visible on the fourth day of incubation. These colonies were of two types, a 4-mm. colony with homogeneous center, translucent with opaque even edge, and a small 1- to 2-mm. colony with opaque center and uneven edge. Other serotypes became visible only after 10 to 14 days of incubation, and a few required an additional 2 to 5 days to assume their characteristic colonial appearance. Transparent, spreading colonies were produced by 3 serotypes including *Leptospira icterohaemorrhagiae*

strain Wijnberg, *Leptospira pomona* LC34, and *Leptospira djasiman*. Colonies of *Leptospira canicola* strain R and *Leptospira bataviae* strain SvT rarely exceeded a diameter of 3 mm., even after prolonged incubation and appeared with minute, multiple opaque centers surrounded by halos of translucent growth. Two other general morphologic colony types were regularly exhibited by the remaining serotypes.

All leptospiral colonies grew just beneath the surface of the agar and were cup-shaped in cross section. When flooded with 1 per cent dimethyl-p-phenylenediamine oxalate, the colonies gave a rapidly positive oxidase reaction which considerably increased their visibility.—[J. C. Armstrong and H. S. Goldberg: *Observations on the Colonial Morphology of Leptospire*. *Am. J. Vet. Res.*, 21, (March, 1960): 311-315.]

Serum Protein-Bound Iodine in Dairy Cows

Blood samples taken from 106 dairy cows in 9 herds under varying circumstances were tested for protein-bound iodine (PBI). Values ranged between 2.1 and 18.3 mg./100 ml. of serum with an over-all average of 9.0. The average PBI value for all known pregnant cows (18) was 12.6 mg./100 ml. and for nonpregnant animals (88) the value was 8.6. This difference is statistically sig-

nificant. The average for anestrus cows was 7.3 and for "repeat breeder" cows, 9.3 mg./100 ml. serum. There was no indication that infertility was associated with abnormal thyroid function.—[G. K. Kiesel and M. J. Burns: *A Preliminary Report on the Serum Protein-Bound Iodine in Dairy Cattle*. *Am. J. Vet. Res.*, 21, (March, 1960): 226-229.]

Cobalt Pellet Therapy in Cattle

Heavy pills or pellets containing 90 per cent cobalt oxide and weighing 20 Gm. were extensively tested for correcting cobalt deficiency in cattle. Such pellets were retained in the rumen or reticulum for many months by virtue of their specific gravity (4.0) and weight. Of 173 cattle treated at 6 weeks to 20 months of age, 149 animals (86%) were shown by x-ray fluoroscopic, or postmortem

examinations to have retained the pellet for at least 2 to 7 months. Calves treated at less than 6 weeks of age did not retain pellets satisfactorily. Of 90 treated lactating dairy cows, 39 (43%) retained a pellet for 4 to 7 months.

Eleven experiments with 246 cattle fed pasture only showed that a single treatment was effective for correcting subclinical or

gross cobalt deficiency, determined by growth rate, and for increasing and maintaining liver vitamin B₁₂ concentration for at least 6 to 8 months after treatment.

Symptoms of cobalt deficiency in cattle were associated with liver vitamin B₁₂ concentrations less than 0.10 μ . per gram of wet

weight, while concentration exceeding 0.30 μ . per gram were needed for optimum weight gain.—[K. D. Skerman, A. K. Sutherland, M. W. O'Halloran, J. M. Bourke, and B. L. Munday: *The Correction of Cobalt or Vitamin B₁₂ Deficiency in Cattle by Cobalt Pellet Therapy*. *Am. J. Vet. Res.*, 20, (Nov., 1959): 977-984.]

Pathogenesis of the Viruses of Newcastle Disease and Influenza B

The administration of cortisone 24 hours after the inoculation of the Lee strain of influenza B virus into the allantoic chambers of chicken embryos resulted in a prolongation of embryo survival time; it had no similar effect on the course of Newcastle disease virus (NDV) infection. Cortisone did not affect the rate of multiplication or the final yields of either virus. Allantoic chamber inoculation with the Texas-GB-1948 strain resulted in a rapid, general infection with extensive damage to the embryo. Allantoic chamber inoculation with the Lee strain produced an infection largely confined to the cells of the chorioallantoic membrane.

The administration of cortisone 24 hours

after the inoculation with the Lee strain was found to suppress or reduce extent of inflammatory response of this membrane. It failed to alter the nature or extent of the pathologic changes induced by NDV in the embryos. The prolongation of survival time of embryos infected with influenza virus appears to have been due to the suppression of cellular damage to the membrane. The failure of cortisone to affect the course of NDV infection of the embryo appears to be due to the fact that the infection becomes generalized.—[L. Murchelano and R. P. Hanson: *Comparison of the Pathogenesis of Newcastle Disease Virus and Influenza B Virus in Chicken Embryos*. *Am. J. Vet. Res.*, 21, (March, 1960): 285-287.]

New Books

A Stereotaxic Atlas of the Dog's Brain

This book seems to be divided into two sections as far as utility for veterinary medicine is concerned. The development of stereotaxic procedures for the dog should be most helpful for reasonable localization in experimental procedures in veterinary anatomy, physiology, and pharmacology. With its use will come appropriate modifications for the study of the more specific regions of the brain. The application of stereotaxic procedures in clinical veterinary medicine must wait for research to establish its rational use.

The second apparent division is the atlas. The myelinated fiber-stained photographs

are generally good but are a bit small. Some of the structures in the adjunct drawings, when most obvious, are not labeled.

The photographs of the cell-stained preparations are too small and show some confusing artifacts. These photographs would be impossible to interpret without the artist's assistance.

In spite of these shortcomings we have found the atlas useful in teaching veterinary students neuroanatomy.—[*A Stereotaxic Atlas of the Dog's Brain*. By Robert K. S. Lim, Chan-nao Liu, and Robert Moffitt. 1st ed. 93 pages; illustrated. Charles C. Thomas, 301-327 East Lawrence Ave., Springfield, Ill. 1960.]—C. C. TURBES.



Constituent Secretaries —Key Men

Series I

Last year, the JOURNAL published a seven-part series on the Presidents of the various Constituent Associations, beginning with the June 1, 1959, issue.

This year, the JOURNAL salutes the Secretaries of the Constituent Associations of the AVMA in a pictorial series. A fine way to show your appreciation for his behind-the-scenes endeavors is to become better acquainted with your secretary and to familiarize yourself with what he is attempting to do in your state or province.

The activities of these men are important not only to you but to organized veterinary medicine everywhere. The AVMA is neither more nor less than a federation of constituent associations and the progress and interests of each of these can vitally concern all others. The Secretary is the *key man* who transforms information to action at the state level.

Some of the Secretaries in this series were participants in the First Annual Conference of AVMA Constituent Association Secretaries in Chicago last November (see the JOURNAL, Jan. 1, 1960, pp. 35-39, for a pictorial digest).

Alabama
Dr. McKenzie Heath
(API '19)



Alaska
Lt. Col. Everett H. Akins
(OSU '37)

Arkansas
Dr. Thayer D. Hendrickson
(TEX '46)



British Columbia
Dr. H. L. Bryson
(ONT '41)

California
Mr. Kenneth Humphreys,
Executive Secretary



Colorado
Dr. Gail H. Gilbert
(COL '41)



Delaware
Dr. Morris S. Cover
(Up '38)

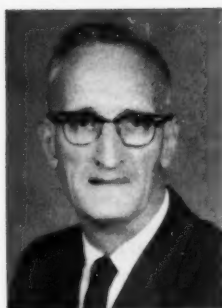
District of Columbia
Dr. E. Edgar Ruebush
(COR '43)



Florida
Dr. M. W. Emmel (ISU '19)
Executive Secretary

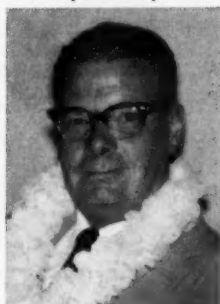


Florida
Dr. Arthur R. Chambers, Secretary
(API '49)



Georgia
Dr. A. M. Mills
(COR '20)

Hawaii
Dr. Frederick T. Lynd
(OKL '53)



Idaho
Dr. A. P. Schneider
(WSU '38)



Illinois
Dr. C. B. Hostetler
(KSU '43)



Iowa
Dr. F. B. Young
(KSU '19)

Kansas
Dr. Melvin W. Osburn
(ISU '34)



Kentucky
Dr. Lenwood S. Shirrell
(ISU '52)



Louisiana
Dr. Robert K. Morris
(TEX '48)



Maine
Dr. J. F. Witter
(MSU '32)

Maryland
Dr. H. L. Schultz, Jr.
(UP '50)





Minnesota
Dr. Benjamin S. Pomeroy
(ISU '33)

Montana
Dr. George A. Morrison
(WSU '32)



New Brunswick
Dr. Robert H. Henry
(ONT '31)

Instruction on Pathology of Laboratory Animals To Be Held in September

The seventh annual course on the Pathology of Diseases of Laboratory Animals presented by the Armed Forces Institute of Pathology, Washington, D.C., is scheduled for Sept. 26-30, 1960. This is a departure from the previous scheduling for the first week of December.

The course is designed to provide training for scientists who are responsible for the recognition and interpretation of lesions in experimental animals, or have charge of procurement and maintenance of animal colonies. It is intended particularly to help them interpret natural diseases which may negate experimental results or influence the supply of laboratory animals or their suitability for experimental use. Pathology will be the theme of the course but this fact will be used as a point of departure for discussion of etiology, diagnosis, and control of the diseases under consideration.

The course will be of value only to those individuals qualified to understand disease processes and to absorb information in the field of pathology. Veterinary pathologists should find the course of particular benefit but pathologists, veterinarians, and others with a similar professional background will also find the course of value.

Applications for attendance may be obtained by writing to: The Director, Armed Forces Institute of Pathology, Washington 25, D.C. Applications should be submitted not later than Aug. 15, 1960.

Although this course is primarily designed for military personnel, a limited

number of spaces have been allocated for civilian scientists. Applications will be accepted from civilians only until this quota is filled.

American College of Veterinary Pathologists Announces 1960 Examination

Applications are now being accepted for the 1960 A.C.V.P. examination. The applications will be considered at the time of the AVMA meeting in Denver, Colo., this August. Therefore, they should be in the hands of the secretary-treasurer on or before Aug. 1, 1960—sooner, if possible.

The following general prerequisites are listed for the information of interested veterinarians:

- a.—Have satisfactory moral and ethical standing in the profession.
- b.—Be a graduate of a veterinary school recognized by the AVMA.
- c.—Be a member in good standing of the AVMA.
- d.—Have qualified at some time to practice veterinary medicine either by successfully completing the national or any state board examination.
- e.—Have completed at least five calendar years of professional experience, exclusive of reasonable vacation periods, subsequent to graduation from veterinary school, at least two years of which shall be supervised and acceptable training in pathology. At least one of the additional three years of experience shall be in teaching, research, or practice of veterinary pathology.
- f.—Submission of a detailed statement of the applicant's qualifications, including references of any publications, and other evidences of professional experience and competence.

Application forms and detailed information may be secured by writing to: Dr. T. C. Jones, Secretary-Treasurer, American College of Veterinary Pathologists, 180 Longwood Ave., Boston 15, Mass.

Among the States and Provinces

California

SAN FRANCISCO—STATE SUMMER CONVENTION.—One of the most practical, down-to-earth programs on veterinary medicine ever presented in the West is scheduled for the 72nd annual convention of the California V.M.A., June 27-29, at the Jack Tar Hotel.

Outstanding speakers from six states will give papers on large and small animal practice; business executives will discuss investment and estate planning; a self-analysis panel will discuss the profession of veterinary medicine, and the results of a state-wide questionnaire on the evaluation of business management will help shed light on the veterinarian's role as a business man, as well as a professional man.

Of special interest to practitioners attending the meeting will be a group of workshops, with specialized discussions on such subjects as—skin diseases of the aged dog, bird practice, orthopedic appliances and procedures, and laboratory aids in dairy herd health programs. Also, panel discussions and question and answer periods will be held.

Among the distinguished speakers will be: Dr. William A. Hagan, former dean of the New York State Veterinary college at Cornell University and presently director of the USDA's Animal Disease Laboratory in Ames, Iowa; Dr. Fred G. Cummings, Seattle practitioner; Dr. Wade O. Brinker, Michigan State University; Dr. Richard L. Ott, Washington State College; Dr. Harold J. Hill, Denver, and Dr. E. A. Woelffer, practitioner from Oconomowoc, Wis.

Dr. R. L. Collinson, Modesto, is program chairman. Fifty-two exhibitors will display their products before an estimated 500 veterinarians. This year, for the first time, the California V.M.A. is sending a personal invitation to every veterinarian in the western States and Hawaii.

Colorado

C.S.U. VETERINARY SENIOR, B. L. COTTON, AWARDED SCHOLARSHIP.—Mr. Bailey L. Cotton of Meeker, a senior in the College of Veterinary Medicine at Colorado State Uni-

versity has been awarded a \$500 scholarship by the First National Bank of Fort Collins.

The scholarship, provided by the bank through the C.S.U.'s Development Fund, is granted each year to an outstanding senior student in the College of Veterinary Medicine. Mr. Cotton is a member of the AVMA Student Chapter and vice-president of the University's Phi Zeta Chapter. He plans to engage in large animal practice following graduation.

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ONE C.S.U. VETERINARY STUDENT KILLED AND TWO INJURED IN N. M. HIGHWAY ACCIDENT.—Mrs. Lauretta Jean Armer, 22, was killed and her husband, Frank C. Armer, Jr., driver of the car, suffered a fractured leg on the highway between Farmington and Gallup, N. M., March 12.

Accompanying the Armers was Richard A. Rezzonico of Flagstaff, who fractured an arm in the accident. All were seniors in the College of Veterinary Medicine and scheduled to receive their D.V.M. degrees in June. They were enroute to Arizona to spend their spring vacation with their families.

Mr. Armer's car struck a water-filled dip in the highway which caused him to lose control of his vehicle. The car then sped head-on into a pick-up truck carrying five Indians. One of the Indians was killed and the other four passengers were injured.

Georgia

ATHENS—SOUTHERN RESEARCH WORKERS ELECT NEW ROSTER.—The Animal Disease Research Workers in the Southern States, an organization dedicated to coordinate research in animal diseases, held their fourteenth annual meeting at the University of Georgia, March 31-April 1, 1960. A program of 37 papers was presented.

The following officers were elected for 1960-1961: Drs. R. D. Turk, A.&M. College of Texas, president; A. L. Kleckner, University of Georgia, vice-president; and D. A. Porter, USDA Regional Laboratory, Auburn, Ala., secretary-treasurer.

The fifteenth annual meeting will be held at the A.&M. College of Texas, April 6-7, 1961.

s/D. A. PORTER, Secretary.

Maine

ORONO—SPRING MEETING OF STATE ASSOCIATION.—Penobscot Valley Country Club

was the site of the spring meeting of the Maine V.M.A. on April 12, 1960. Dr. John M. Woodcock, president, presided.

The scientific portion of the meeting was devoted to: Drs. Deane Chamberlain, Hulls Cove—skin of the dog; Sidney W. Stiles, Portland—induction of ether anesthesia in the cat and cat castration technique; Robert Monahan, Brunswick—new oxygen apparatus; Bruce Poulton, head, Department of Animal Science, University of Maine—research in animal science; Harold Chute, Department of Animal Pathology, University of Maine—research in animal pathology; and Prof. Howard Mendall, head, Department on Wildlife, University of Maine—research in wildlife.

The Association's guest speaker was Dr. H. Earl Knapp, district veterinarian of the Maritimes and president of the New Brunswick V.M.A., who discussed the Maritime organization and policies with particular emphasis on its rabies control program.—*The Maine Veterinarian*, 21, (April, 1960): 1.

Massachusetts

BOSTON—M.V.A. HOLDS PUBLIC SERVICE SYMPOSIUM.—A highly successful symposium on "Responsibilities Involved in Auto Injury of Domestic Animals" featured the afternoon session of the annual spring meeting of the Massachusetts Veterinary Association, held at the Statler Hilton Hotel, March 23.

Dr. E. W. Tucker, president of the Association, said in his introductory remarks, "Hundreds of auto cases involving domestic animals are seen daily by Massachusetts

veterinarians yet no one involved in such emergencies knows the exact area of responsibility or liability. To clear up many of the misunderstandings and to help establish a common procedure, we are presenting this public service symposium."

The Program's Roster

Local authorities who participated were: Thomas A. Corkery, dog officer of Middlesex County; Thomas J. Maquire, chief of police, Woburn, Mass., representing the Massachusetts Police Chiefs' Association; Leo Sontag, assistant attorney general of Massachusetts; Major-General O. M. Whitney, Massachusetts' commissioner of insurance and former commissioner of public safety; Dr. C. Lawrence Blakely, director of surgery, Angell Memorial Animal Hospital; Dr. Harrison B. Siegle, second vice-president, Massachusetts Veterinary Association.

Future Meeting Dates

At the Association's business meeting, the members set the dates for the balance of 1960 meetings as follows: June 8—Amherst, Mass.; September 14—Worcester, Mass.; October 19—in conjunction with the New England V.M.A. in Providence, R.I.

Copies Available

The entire Symposium was tape-recorded for future use. This material will be edited and presented in booklet form as a public service, by the Massachusetts V.A. Any association desiring copies should write: Dr. Edgar Tucker, President, 11 Martin Rd., Concord, Mass.



Public Service Symposium participants at the spring meeting of the Massachusetts V. A. March 23, in Boston.

Left to right seated—Leo Sontag, assistant attorney general of Massachusetts; Dr. Edgar W. Tucker, M.V.A. president; Major-General O. M. Whitney, Massachusetts commission of insurance. Standing—Dr. C. Lawrence Blakely, director of surgery, Angell Memorial Animal Hospital; Dr. Harrison B. Siegle, M.V.A. second vice-president; Thomas A. Corkery, dog officer, Middlesex County; Thomas J. Maquire, chief of police, Woburn.

Michigan

DR. SMITHCORS ELECTED TO A.A.H.M. COUNCIL.—Dr. J. F. Smithcors, (COR '45), associate professor of anatomy in Michigan State University's College of Veterinary Medicine, has been elected to the Council of the American Association for the History of Medicine. His election took place at a recent meeting of the Association at Charleston, S. C.

The A.A.H.M. is composed of persons engaged in teaching and research in the history of medicine and allied sciences. Dr. Smithcors, a leading authority on the history of veterinary medicine, was the first veterinarian to become a member of this group, and is president of the American Veterinary Historical Society. The author of more than 70 articles on historical subjects published in the medical history and veterinary journals of the United States and England, he is also a contributor to the "Encyclopedia Britannica." Having written a book entitled, "Evolution of the Veterinary Art," he is currently completing a comprehensive history of veterinary medicine in America under sponsorship of the AVMA. A series dealing with the history of the AVMA began in the July 1, 1959, JOURNAL and will continue until June 15, 1963, at which time it will be bound into a booklet and will be available at the centennial meeting of the AVMA in New York.

The College of Veterinary Medicine at Michigan State University was the first in the United States to include in its curriculum a course in the history of veterinary medicine. The Veterinary Historical Collection, which has received generous support of alumni through the M.S.U. Development Fund, is recognized as the finest collection of old and rare veterinary books in this country.

s/W. W. ARMISTEAD, Dean, College of Veterinary Medicine at M.S.U.

New York

ITHACA—FIFTY-SECOND ANNUAL CONFERENCE FOR VETERINARIANS.—The New York Veterinary College at Cornell University held its 52nd annual conference for veterinarians, Jan. 6-8, 1960. All sessions were held in the James Law Auditorium except for a dinner in Statler Hall and the alumni meeting and dinner at the Ithaca Hotel.

More than 500 veterinarians from the United States and Canada attended. Among the speakers and their respective subjects on the first day of the conference's three-day agenda were: Drs. John Bentinck-Smith, professor of veterinary pathology, Cornell—aspects of clinical pathology useful to a practitioner; Maxine M. Benjamin, associ-



Dean George C. Poppensiek (center) of the New York State Veterinary College at Cornell University and Mrs. Poppensiek confer with Byron T. Shaw (left), administrator, Agricultural Research Service, USDA, Washington, D. C., at the college's 52nd annual conference for veterinarians last January.

Mr. Shaw predicted that farmers in the United States would have to double food output in the next 50 years to feed an estimated population of more than 370,000,000 in the year 2010. The increased output will have to be effected by the advancement of the biological sciences on about the same acreage now being used, he said.

ate professor, Department of Pathology and Bacteriology, Colorado State University, College of Veterinary Medicine—practical aspects of fluid and electrolyte therapy; Benjamin F. Hoerlein, professor of surgery and medicine, Auburn University—spinal surgery in the dog and intervertebral disc protusion; Robert P. Knowles, Miami, Fla.—plastic surgery in dogs; Leon Z. Saunders, head, pathology and toxicology section, Smith, Kline, and French Laboratories, Philadelphia, Pa.—visual defects in Collie dogs; and U. V. Mostosky, instructor, Michigan State University, School of Veterinary Medicine—fractures of the elbow.

The morning of the second day consisted of the following speakers: Drs. Ellsworth Dougherty III, director of Duck Disease Research Laboratory, Eastport, N.Y.—some new aspects of eastern equine encephalomyelitis; John H. Graves, acting-in-charge, immunological investigations, Plum Island Animal Disease Laboratory, Greenport, N.Y.—foot-and-mouth disease: infection and response; Sam K. Sinha, director of biological research, Jensen-Salsbery Laboratories, Kansas City, Mo.—new viruses associated with shipping fever; and Peter C. Kennedy, assistant professor of veterinary pathology, University of California, School of Veterinary Medicine—miscellaneous sheep diseases.

A panel consisting of four Cornell faculty members discussed "New Knowledge About Virus Diseases of Cattle in New York." The panelists were: Drs. James A. Baker, professor of veterinary virology and director of the Veterinary Virus Research Institute; James H. Gillespie, professor of veterinary bacteriology and assistant director of the research laboratory for diseases of dogs; Peter H. Langer, research associate in the Department of Pathology and Bacteriology; and Kenneth McEntee, professor of veterinary pathology.

In the afternoon session of the second day, participants were: Drs. Phillip P. Levine, professor of veterinary pathology, who presided; M. M. Nold (Lt. Col.), U.S. Air Force, laboratory of radiation biology, Cornell—the practitioner and nuclear disaster; Alexander Zeissig, director of veterinary research, Merck, Sharp, and Dohme—revolution or evolution; Harry E. Kingman, Jr., executive secretary, AVMA—trends in organized veterinary medicine; Donald J. Dean, veterinary consultant, Bureau of Epidemiology and Communicable Disease Control, New York State Health Department—potency testing of modified-live virus antirabies vaccine; Alan A. Creamer, manager of the veterinary department, Merck, Sharp & Dohme, West Point, Pa.; and Robert S. Sauer, associate professor of veterinary pathology, School of Veterinary Medicine, University of Pennsylvania—monkey health problems.

On January 8, conferees heard: Drs. William Wagner, field veterinarian, Department of Pathology and Bacteriology, Cornell—herd approach to infertility of cattle; Francis H. Fox, professor of veterinary medicine and obstetrics, Cornell, and John F. Kava-

naugh, resident surgeon in the Department of Surgery, Cornell—disorders of the bovine abomasum; David E. Bartlett, American Breeders Service—the role of the veterinarian in artificial insemination; Peter C. Kennedy—hemophilus encephalitis in cattle; and John M. King, instructor in veterinary pathology, Cornell—proliferative pneumonia in cattle.

The concluding session included the Raymond R. Birch Memorial Lecture, sponsored by classmates and friends of the late professor: Dr. Douglas G. Blood, professor of medicine, Ontario Veterinary College, University of Toronto, delivered a lecture on "Diseases Affecting the Nervous Systems of Calves." Clinical demonstrations were held following the lecture.

Pennsylvania

PHILADELPHIA—TWO VETERINARIANS, DR. RAPP & SCHRYVER AND ONE VETERINARY STUDENT, R. O. DAVIES, RECEIVE SCHOLARSHIPS.—Five young scientists have been awarded Pennsylvania Plan Scholarships for postgraduate study in the basic medical sciences at the University of Pennsylvania; two are veterinarians and one is a veterinary student.

This is the third group of awards to be made under Pennsylvania's pioneer program of scholarship aid to outstanding graduates of medical, dental, and veterinary schools. Of the newly appointed scholars, three will study veterinary subjects.

Among the winning candidates are: Dr. John P. Rapp (COR '59); Richard O. Davies (Cornell—June, 1960); and Dr. Herbert F. Schryver (COR '54). They will begin their study, July 1.

Under this plan, scholars are awarded \$7,500 a year for three years. This includes \$6,000 for living expenses and \$1,500 for laboratory equipment and supplies. The funds come from subscriptions of industrialists, businessmen, and other interested individuals.

The shortages of fully trained scientists exist largely because too few graduates in the medical fields can afford the extra three years required to ready them for their careers. Object of the Pennsylvania Plan, inaugurated in January, 1958, is to help relieve the shortage of basic science teachers and researchers in the nation's medical, dental, and veterinary schools and colleges.

Texas

DALLAS—TEXAS VETERINARIANS LAUNCH RABIES PLAN.—A state-wide program for the voluntary prevention of rabies among domestic animals was announced in February, 1960, by Dr. H. T. Barron of Taylor, president of the Texas V.M.A. The plan calls for cooperation between civic officials and public groups and members of the veterinary profession throughout the state.

Emphasis will be placed on public education, to make sure all pet owners know that, not only is rabies preventable through immunizing vaccination, but that such vaccination may be ineffective or even harmful if improperly administered. At the same time, he said, the Texas V.M.A. is calling on all regional officials and local veterinary organizations to cooperate with local rabies programs, so that all immunization may be done under the supervision of licensed veterinarians.

Dr. Barron cited the case last year where a small central Texas city launched a "rabies drive" through civic organizations, and sponsored vaccinations performed by non-medical persons. The vaccine was administered without proper sterilization precautions, and many animals developed painful and sometimes fatal infections. The immunization is negative when such infection develops, he stressed.

Some cities and counties have local health regulations calling for compulsory annual vaccination of all pets. Wherever these regulations are enforced, there is little or no annual outburst of apprehension about "dog days."

In many parts of Texas, there is no such requirement, consequently, the Texas V.M.A. feels that it is up to civic and county leaders and the veterinary profession to cooperate in encouraging voluntary immunization programs at the local level, making certain that the vaccination is performed properly and that the way in which the disease can be controlled is fully understood.

Washington

PULLMAN—DIGEST OF TWELFTH ANNUAL CONFERENCE.—The twelfth annual conference for veterinarians was held at Washington State University, April 4-6. Two hundred fifty American and Canadian veterinarians attended.

Speakers and television demonstrations other than those from the University in-

cluded the following: Drs. T. C. Jones, Boston, Mass.—clinico-pathologic conference; Dale K. Sorenson, St. Paul, Minn.—large animal ophthalmology, hematological diseases of large animals, clinical examination of the equine eye, and canine transfusion technique; Jacques Jenny, Philadelphia, Pa.—a conservative approach to fracture repair in the dog, stifle injuries of the dog, and open and closed reduction of common fractures; Howard Sussman, Portland, Ore.—fluid and electrolyte therapy in animals; Edward Foubert, Spokane, Wash.—fundamental concepts of allergy; Donald Mackey, Greeley, Colo.—the place for the large animal veterinarian in the vertically integrated livestock industry, intratracheal administration of drugs for infectious bovine rhinotracheitis, and clinical hints in treatment of feedlot diseases; John Wheat, Davis, Calif.—clinical aspects of infertility in the horse, nerve and field blocks of the equine leg, treatment of equine tendinitis and suspensory ligament disorders, and the diagnosis and treatment of lamenesses in the horse; Roy Hostetler, Olympia, Wash.—aspects of Delaney amendment affecting the veterinary profession; R. Berg, and H. Lang, Spokane, Wash.—concepts of extracorporeal circulation and operation of heart lung machine; and R. J. Anderson, Washington, D.C.—cooperative livestock regulatory activities.

Veterinary Military News

District of Columbia

WASHINGTON.—More than 60 persons attended the veterinary section meeting, sixtieth annual convention of the Association of Military Surgeons of the United States, at Washington, D.C., last November.

Captain George D. Smith, USAF, V.C., discussed selection and utilization of animals in space research and predicted that we will eventually have completely self-sufficient life systems for space exploration and even for interplanetary travel. Development of regenerative systems for food, water, and oxygen has stayed ahead of engineering development for keeping large masses in space.

Lt. Colonel C. A. Gleiser, USA, V.C., presented an interesting paper which he had prepared jointly with Lt. Colonel W. S.

Gochenour, Jr., USA, V.C. and Colonel R. H. Yager, USA, V.C.; an experimental approach to infectious diseases in veterinary medicine. It dealt with the fact that new and complex techniques are necessary for more productive research on infectious diseases. Biological experiments on animals can best be planned, conducted, and evaluated by, or with the assistance of, veterinarians. An example given was the work he and his associates had done in developing methods for subjecting experimental animals to infectious aerosols containing suspended particles of definite size and in controlled doses, simulating actual conditions and variables of human exposures to the causative agents of respiratory diseases.

Biomedical aspects of nuclear powered aircraft were discussed by Lt. Colonel C. M. Barnes, USAF, V.C. Among advantages cited for nuclear aircraft was the ability to operate without refueling as long as crew members can "last," and to operate completely from bases in the United States. Problems include the necessity for remote-controlled, shielded equipment, and facilities for repair and maintenance of nuclear units.

Dr. Fred J. Kingma of the U. S. Food and Drug Administration presented a paper, "Federal Food and Drug Legislation—Its Significance to Veterinarians." He pointed out that the new food additives amendment

to the Food, Drug, and Cosmetic Act covers substances which remain as residues in milk and other foods of animal origin as a result of use on crops; in animal feeds; or injection or other administration into or on animals, whether for prevention or treatment of disease, control of parasites, or growth promotion.

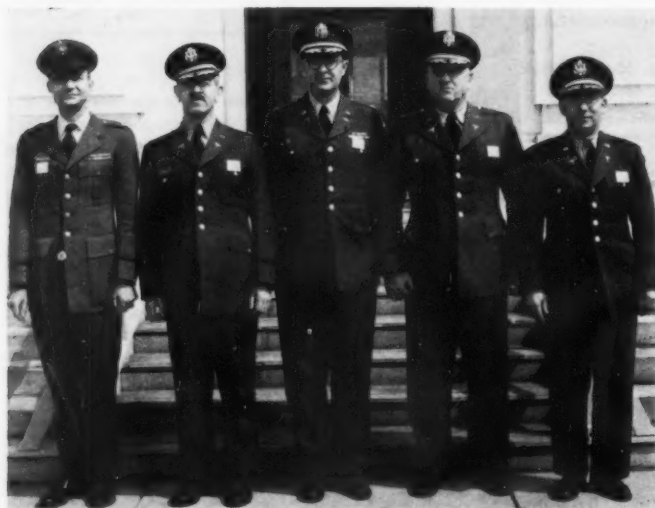
A particular problem mentioned was penicillin residues in milk. Over 75 tons of antibiotics are used each year in mastitis ointments. The Food and Drug Administration is initiating an enforcement program to sample lots of milk for penicillin or pesticides; the program may include seizures, injunctions, and prosecution.

Dr. Kingma emphasized the veterinarian's responsibility to warn the dairyman against sale of the milk from cows treated with penicillin until free of residues. While penicillin infused into the udder will, for practical purposes, be absent from the milk after about 72 hours, the administration of some systemic products may result in detectable penicillin residues in the milk for periods up to 7 days.

s/JOE W. ATKINSON, Secretary, Conference of Public Health Veterinarians.

Maryland

BETHESDA—VETERINARIANS PARTICIPATE IN MILITARY MEDICAL TRAINING PROGRAM.—Five U. S. military veterinarians attended the



Attending veterinarians are, left to right—Lt. Col. R. B. Leathers, USAFR, Fort Worth, Texas; Major I. M. Saturen, USAR, Lancaster, Pa.; Major R. J. Byrne, USAR, Silver Spring, Md.; Major Martin Kagan, USAR, Albuquerque, N. M.; and Lt. Col. L. G. Kutsher, USAR, East Stroudsburg, Pa.

Military Medical Training Program for the Armed Forces medical department officers conducted at the U. S. Naval Medical School, National Naval Medical Center in Bethesda, from March 13 to 25, 1960.

This was the twenty-ninth presentation of the Naval Medical School's course in the medical aspects of special weapons. Since the initial presentation in 1948, approximately 3,445 officers have attended the course. Originally limited to one week, the training period was extended to two weeks in 1953. This was the twelfth presentation of the two-week course.

S/LT. JAMES P. HOLLIDAY, Jr., M.S.C.,
U.S. Navy, Asst. Ser. Infor. Officer.

State Board Examinations

ALABAMA—June 6-7, 1960, Auditorium of State Administration Building, Montgomery, Ala. The deadline is May 25. The application and examination fee is \$27.50. Dr. Ray A. Ashwander, Secretary, Box 1767, Decatur, Ala.

ARIZONA—June 22-23, 1960, Arizona State College, Flagstaff, Ariz. Deadline for applications is June 12; the fee is \$25. Dr. William E. Snodgrass, Secretary, 1612 W. Washington St., Phoenix, Ariz.

ARKANSAS—June 16-17, 1960, 2400 East Fifth St., Little Rock, Ark. Telephone # is Franklin 2-5129; the fee is \$10. Dr. David Ibsen, 2400 East Fifth St., Little Rock, Ark., Secretary.

BRITISH COLUMBIA—June 4, 1960, Vancouver, B.C. The fee is \$25. Dr. Kenneth Chester, Registrar, 2853 W. 33rd St., Vancouver, B.C., Can.

CALIFORNIA—June 14-16, 1960, School of Veterinary Medicine, University of California, Davis, Calif. Deadline for applications is 30 days prior to the examination for approved veterinary school graduates and 90 days for foreign applicants; the fee is \$25. William E. Barbeau, Board of Examiners in Veterinary Medicine, 1020 N. St., Sacramento 14, Calif.

COLORADO—May 31-June 2, 1960, Colorado State University, Veterinary Hospital, Fort Collins, Colo. Deadline for applications was April 30; the fee is \$25. Dr. V. D. Stauffer, Secretary, 5500 Wadsworth Blvd., Arvada, Colo.

CONNECTICUT—July 12-14, 1960, Hartford, Conn. Deadline for applications is July 2; the fee is \$50. Dr. Salo Jones, Secretary, Room 285, State Office Building, Hartford, Conn.

DISTRICT OF COLUMBIA—June 26, 1960, Department of Occupations and Professions, 1740 Massachusetts Ave., N.W., Washington, D.C. Deadline for applications is June 2; the fee is \$25. Dr. Alan F. McEwan, Secretary, Board of Examiners in Veterinary Medicine, 1740 Massachusetts Ave., N.W., Washington, D.C.

FLORIDA—June 13-15, 1960, Municipal Auditorium, Miami, Fla. (Headquarters—Biscayne Terrace Hotel). Deadline for applications is June 1, the fee is \$25. Dr. E. F. Thomas, Secretary, Florida State Board of Veterinary Medical Examiners, 4937 S. Tamiami Trail, Sarasota, Fla.

GEORGIA—June 9-10, 1960, State Capitol, Atlanta, Ga. Applications should be on file in the office of the Joint Secretary at least 15 days prior to the date of the

examinations; the fee is \$10. Address: Joint Secretary, State Examining Boards, 224 State Capitol Building, Atlanta, Ga.

HAWAII—Sept. 22-24, 1960, Honolulu, Hawaii. Deadline for applications is Aug. 22; the fee is \$25. Dr. Wilson M. Pang, Secretary, 1683 Kalakaua Ave., Honolulu 14, Hawaii.

IDAHO—June 9-10, 1960, Capitol Building, Boise, Idaho. Deadline for applications is May 10; the fee is \$25. Miss Nan K. Wood, Director, Occupational License Bureau, Capitol Building, Boise, Idaho.

ILLINOIS—June 29-July 1, 1960, Chicago office of the Department of Registration and Education, 160 N. LaSalle St., Chicago, Ill. Deadline for applications is June 14; the fee is \$20. Mr. Fredric B. Selcke, Superintendent of Registration, Capitol Building, Springfield, Ill.

INDIANA—July 12-13, 1960, State House, Indianapolis, Ind., at 8:00 a.m. Deadline for applications is 30 days preceding the day of the regular meeting for the applicants applying by examination; 15 days if applying by reciprocity. Those applying for examination, a \$40 fee must accompany the application; for those coming in by reciprocity, the fee is \$50. Dr. Joe W. Green, Secretary Veterinary Examining Board, State Board of Health Building, Room 422, 611 Park Ave., Indianapolis, Ind.

IOWA—May 31-June 1, 1960, Des Moines, Iowa. Applicants must be in the office of the Division of Animal Industry, State House, Des Moines, not later than 8:00 a.m., on May 31. Additional information may be obtained by writing: Dr. A. L. Sundberg, Chief, Division of Animal Industry, State House, Des Moines 19, Iowa.

KANSAS—May 31-June 2, 1960, Dykstra Building, Kansas State University, School of Veterinary Medicine, Manhattan, Kan. Deadline for applications was May 1; the fee is \$10. Dr. Charles W. Bower, Secretary, 1128 Kansas Ave., Topeka, Kan.

KENTUCKY—July 25, 1960, Capitol Building, Frankfort, Ky. Deadline for applications is July 11; the fee is \$25. For Applications and information, write: Mr. William E. Johnson, 319 Ann St., Frankfort, Ky. (A special June examination is usually given; the exact date has not been set.)

MAINE—July 11-12, 1960, Dr. Libby's office, 6th Floor, Office Building, Augusta, Maine. Deadline for applications is 15 days before the examination. There is a \$20 fee with each application. Dr. E. C. Moore, Secretary, Turner Center, Maine.

MARYLAND—June 6-7, 1960, Symons Hall, University of Maryland, College Park, Md. The examination begins promptly at 8:00 a.m. Deadline for applications is June 1; the fee is \$25. Dr. Harold S. Gober, Secretary, 5400 Park Heights Ave., Baltimore 15, Md.

MASSACHUSETTS—June 22-24, 1960, University of Massachusetts, Amherst, Mass. Deadline for applications is at least one week prior to the examinations date; the fee is \$25. Dr. Edward A. Zullo, Secretary, Board of Registration in Veterinary Medicine, Room 33, State House, Boston 33, Mass.

MICHIGAN—June 20-21, 1960, Veterinary Building, Room 146, Michigan State University, East Lansing, Mich., at 8:00 a.m. Deadline for applications is June 5; \$25 fee is to accompany applications. Dr. John F. Quinn, Corresponding Secretary, Board of Veterinary Examiners, Sixth Floor, Lewis Cass Building, Lansing 13, Mich.

MINNESOTA—July 12-13, 1960, College of Veterinary Medicine, University of Minnesota, St. Paul Campus, St. Paul 1, Minn., at 8:00 a.m. each day. Deadline for applications is 30 days prior to the examinations; the fee is \$25. Dr. A. C. Spannaus, Executive Secretary, Veterinary Examining Board, Route #1, Waconia, Minn.

MISSISSIPPI—June 21, 1960, Woolfolk State Building, Jackson, Miss. Deadline for the applications is June 11,

- the fee is \$25. Dr. William L. Gates, Secretary, Box 417, Clarksdale, Miss.
- MISSOURI**—June 2-3, 1960, Veterinary Clinic, University of Missouri, Columbia, Mo. Deadline for the applications is 15 days prior to the date of the examination; the fee is \$25. Dr. L. A. Rosner, Chairman, Box 630, Jefferson City, Mo.
- MONTANA**—June 20-22, 1960, Senate Chamber, Helena, Mont. Deadline for applications is May 31; the fee is \$25. Dr. J. N. Safford, Secretary, Capitol Station, Helena, Mont.
- NEVADA**—July 23, 1960, Tonopah, Nev. Deadline for applications is June 1; the fee is \$10. Dr. E. H. Stodtmeier, 102 "B" St., Sparks, Nev.
- NEW BRUNSWICK**—June 10-11, 1960, in any provincial capitol. Must be in the office of the registrar, Dr. Claude Kealey, National Examining Board, P.O. Box 416, Ottawa, Ont., Can., by May 15; the fee is \$25. Dr. R. H. Henry, Secretary, Box 338, Moncton, N.B., Can.
- NEW HAMPSHIRE**—July 5, 1960, State House, Concord, N.H. Deadline for applications is June 25; the fee is \$15. Dr. J. P. Seraichick, Secretary, Board of Veterinary Examiners, Chesterfield Rd., Keene, N.H.
- NEW JERSEY**—June 24-25, 1960, State House, Trenton, N.J. Deadline for applications is June 14; the fee is \$25. Dr. Robert R. Shomer, Secretary, 1680 Teaneck Rd., N.J.
- NEW MEXICO**—June 17-18, 1960, State Capitol Building, Santa Fe, N.M. Deadline is two weeks prior to the examination date; a \$25 fee is to accompany applications. Dr. Edwin J. Smith, Secretary, State Board of Veterinary Examiners, P.O. Box 4389, Santa Fe, N.M.
- NEW YORK**—June 15-16, 1960 (practical), June 28-July 1, 1960 (written), at Ithaca, New York City, Buffalo, Syracuse, Rochester, and Albany, N.Y. Applications must be received 30 days before date of examination; the fee is \$40. Mr. James O. Hoyle, 23 South Pearl St., Albany, N.Y.
- NORTH CAROLINA**—June 20-22, 1960, Grove Park Inn, Asheville, N.C. Dr. James I. Cornwell, Secretary-Treasurer, North Carolina State Veterinary Examining Board, P.O. Box 9038, Asheville, N.C.
- NORTH DAKOTA**—Oct. 12-13, 1960, Van Es Building, North Dakota Agricultural College, Fargo, N.D. Deadline for applications is about ten days prior to the examination date; the fee is \$15. Dr. M. C. Hawn, Secretary, N. D. Veterinary Medical Examining Board, 1407-13th St. North, Fargo, N.D.
- OHIO**—June 6-8, 1960, Sisson Hall, College of Veterinary Medicine, Ohio State University, Columbus, Ohio. Applicants must be present at 8:00 a.m. on June 6. Dr. H. G. Geyer, Executive Secretary, Ohio Veterinary Medical Board, Ohio Departments Building, Room 720, Columbus 15, Ohio.
- OKLAHOMA**—May 22-25, 1960, Student Union Building, Oklahoma State University, Stillwater, Okla. Applicants must appear before the Board on May 22 at 2:00 p. m. if applying by reciprocity; if by examination at 7:30 p. m. on May 22. Deadline for applications was April 22; the fee \$25. Dr. C. R. Love, Secretary, 4321 S. Lee, Oklahoma City, Okla.
- OREGON**—June 7-9, 1960, Hotel Multnomah, Portland, Ore., beginning at 8:00 a.m. on June 7. Deadline for applications is one month prior to the date of the examination; the fee is \$25. Dr. C. R. Howarth, 135 N. Highway, St. Helens, Ore.
- PENNSYLVANIA**—June 16-17, 1960, School of Veterinary Medicine, University of Pennsylvania, 39th & Woodland Ave., Philadelphia, Pa. Deadline for applications is May 15; the fee is \$20. Dr. Charles J. Hollister, Secretary, State Board of Veterinary Medical Examiners, Box 911, Harrisburg, Pa.
- PUERTO RICO**—Aug. 2, 1960, Division of Examining Boards, Comercio 452, Carrera's Building, San Juan, P.R. Deadline for applications is July 3; the fee is \$10, the license fee is \$5, and one P.R. Revenue Stamp of \$1. Herminio Mendez Herrera, Secretary, Box 3271, San Juan, P.R.
- RHODE ISLAND**—July 12-13, 1960, Division of Animal Industry, 505 Veterans' Memorial Bldg., 83 Park St., Providence, R.I. Deadline for applications is July 1. Dr. Thomas E. Grennan, Secretary, Providence, R.I.
- SASKATCHEWAN**—June 21-23, 1960, University of Saskatchewan, Saskatoon, Can. Deadline for applications is June 1; the fee is \$25. Dr. W. Turnbull, Health Department, City Hall, Saskatoon, Saskatchewan, Can.
- SOUTH CAROLINA**—June 16-17, 1960, Columbia, S.C. Deadline for applications is June 2; the fee is \$25. Dr. H. L. Sutherland, Secretary, P.O. Box 87, Union, S.C., secretary.
- SOUTH DAKOTA**—June 20-21, 1960, South Dakota State College, Brookings, S.D., Deadline for applications is June 1; the fee is \$10. Dr. M. O. Mitchell, Secretary, Veterinary Examining Board, State Office Building, Pierre, S. D.
- TENNESSEE**—June 27-28, 1960, Cordell Hull Building, Capitol Grounds, Nashville, Tenn. Deadline for applications is June 25; the fee is \$25. Dr. T. H. Bullington, Secretary, R.F.D. #3, Fayetteville, Tenn.
- TEXAS**—May 30-June 1, 1960, A. & M. College of Texas, College Station, Texas. The completed application must be received in the Board office not later than 30 days before the examination date. Mr. T. D. Weaver, Executive Secretary, Texas State Board of Veterinary Medical Examiners, 207 Capital National Bank Building, Austin 16, Texas.
- UTAH**—June 30-July 1, 1960, State Capitol Building, Department of Business Registration, Salt Lake City, Utah. Applications should be submitted to Mr. Frank E. Lees, Director of the Department of Business Regulation and Registration Division, State Capitol Building, Salt Lake City, Utah, by June 15. Registration fee is \$15.
- VIRGINIA**—June 30-July 1, 1960, Senate Chamber, Capitol Building, Richmond, Va. Deadline for applications is May 30; the fee is \$25. Mr. T. N. Burton, Secretary, P.O. Box 1-X, Richmond 2, Va.
- WASHINGTON**—May 26-28, 1960, Wegner Hall, College of Veterinary Medicine, Washington State University, Pullman, Wash. Deadline for applications was May 11; the fee is \$35. Mr. Thomas A. Carter, Administrator, Professional Division, License Department, Olympia, Wash.
- WEST VIRGINIA**—June 20, 1960, Capitol Building, Room E-117 (ground floor of the east wing), Charleston, W. Va. For applications and information, write: Dr. Harry J. Fallon, Secretary-Treasurer, 200 Fifth St. West, Huntington, W. Va.
- WISCONSIN**—June 27-28, 1960, Madison, Wis. Dr. A. A. Erdmann, Chief Veterinarian, State-Federal Cooperative Program, 6 West, State Capitol, Madison 2, Wis.
- WYOMING**—June 21-22, 1960, State Office Building (third floor, south wing), Cheyenne, Wyo. Deadline for applications is June 6; the fee is \$25. Dr. G. H. Good, Secretary, State Office Building, Cheyenne, Wyo.

Deaths

Star indicates member of AVMA

George W. Blanche (ISU '02) 85, San Fernando, Calif., died Jan. 11, 1960.

Dr. Blanche founded the Glendale Small Animal Hospital, was a member of the State

Board of Veterinary Medical Examiners, and past-president of the Glendale Board of Education.

Earl B. Briney (KCV '18), 65, Bennington, Kan., died Sept. 20, 1958, from diabetes and a heart ailment, after a long illness. Dr. Briney was in general practice in Bennington for 38 years.

Herbert A. Brown (CVC '08), 72, Victoria, B.C., died Nov. 21, 1959, from a brain tumor.

Dr. Brown served as a captain in the Fifteenth Brigade of the Canadian Field Artillery in World War I. After the war, he resumed his practice in Victoria.

Robert L. Brown (TEX '44), 37, Amarillo, Texas, his wife, and three children were killed when the car he was driving was struck by a train, Jan. 19, 1960.

Dr. Brown operated a clinic with his two brothers, Dr. Charles D. (TEX '46) and John H. Brown, Jr. (TEX '44), at Amarillo before moving to Wyckoff, N.J., where he was employed by the Shering Drug Company for a little over a year. The Brown family had moved to Caynon, Texas, four months ago.

James E. Burton (IND '17), 78, Slippery Rock, Pa., died after an illness of two months, Dec. 23, 1959. Dr. Burton was made a life member of the AVMA in 1955.

He had been a life-time resident of the Slippery Rock area and had practiced veterinary medicine there for over 10 years.

Ernest E. Chase (ONT '05), 86, Portland, Ore., died Dec. 10, 1959.

Dr. Chase was assistant state veterinarian in Oregon from 1913 to 1916, when he left to open Portland's meat inspection division for the City Health Bureau. He retired from the Bureau in 1951.

Truman W. Cole (CVC '15), 65, Jacksonville, Fla., died suddenly on Jan. 19, 1960. At the time of his death, he was veterinarian in charge of the USDA's Florida field station for animal disease eradication and animal inspection and quarantine in Jacksonville.

Born in McKinney, Texas, Dr. Cole was appointed a veterinary inspector for the

USDA, the same year he graduated from veterinary school. In 1927, he was named veterinarian in charge of the Florida field station at Jacksonville. Ten years later, he became assistant chief of the field inspection division, BAI, in Washington, D.C. He was inspector in charge, port of New York, and superintendent of the animal quarantine division in Clifton, N.J., from 1944 to 1949.

Dr. Cole returned to Washington in 1949 when he was made chief of the interstate inspection division of the former BAI. In 1955, he became chief of the public stockyards section and an area director for the animal disease eradication division, a position he held until 1958 when he was placed in charge of the Florida field station.

In 1956, the USDA presented Dr. Cole with an award for outstanding service in recognition of his contributions to the field of animal health. He is also the author of a number of USDA publications and had been a member of the AVMA for 35 consecutive years.

Edward P. Flower (USC '89), 87, Baton Rouge, La., died Jan. 20, 1960, after a long illness. He was made a life member of the AVMA in 1955.

Dr. Flower had practiced in Louisiana from the time of his graduation from the United States College of Veterinary Surgeons in 1889 until 1908, when he was employed as a state veterinarian by the then newly formed Louisiana Livestock Sanitary Board. At the time of his retirement in 1949, Dr. Flower had served as a state veterinarian longer than anyone else in the country.

Charles H. Gaines (KCV '06), 90, Concordia, Kan., died Dec. 29, 1959. Dr. Gaines practiced veterinary medicine in Concordia from 1918 until his retirement in 1953.

S. D. Graumlich (OSU '11), New Rome, Ohio, died Sept. 5, 1959.

Dr. Graumlich had been in general practice in Hilliards, Ohio, until his retirement a few years ago.

Frank G. Hahn (CIN '04), 80, Asheville, N.C., died Feb. 6, 1960, after a long illness.

Dr. Hahn was a veterinary inspector for the government while working in Cincinnati. Prior to his veterinary career, he was a major league baseball pitcher with the Cincinnati Reds and the New York Yankees. He left baseball in 1906.

Francis A. Harsh (ONT '94), 91, Minerva, Ohio, died Jan. 24, 1960, after two years illness.

A life-long resident of Minerva, Dr. Harsh had been in practice there until his retirement in 1946.

★**Charles H. Herrold** (OSU '04), 79, Dayton, Ohio, died Jan. 18, 1960, after an extended illness.

From 1905 to 1943, Dr. Herrold served in the U.S. Meat Inspection program. He then accepted a similar position with the Dayton Health Department from which he retired six years ago.

His son, Dr. George Herrold, is a physician and one of his brothers, Dr. William Herrold of Columbus, is a graduate of the School of Veterinary Medicine at Ohio State, class of 1907.

Rodney F. Merz (COR '59), 24, Susanville, Calif., died Feb. 14, 1960, from cancer.

A native of New York, Dr. Merz had only practiced in Susanville for six months at the time of his death. He was a member of Omega Tau Sigma and Theta Chi.

★**Clarence F. Milleson** (ISU '22), 60, Portland, Ore., head of the State Board of Veterinary Medical Examiners in Oregon, died Feb. 3, 1960.

An Iowa-born veteran of World War I, Dr. Milleson had moved to Portland in 1924 and had operated a pet hospital there since 1927. He is a former president of the Oregon State V.M.A.

George S. Place (OSU '17), 66, St. Marys, Ohio, died Aug. 17, 1959, following a brief illness.

Dr. Place had practiced in St. Marys since 1917. He is survived by a son who is also a veterinarian, Dr. Robert A. Place (OSU '42), St. Marys.

S. Roy Reed (STJ '16) 67, Beaver City, Neb., died Feb. 11, 1959.

Dr. Reed attended the Kansas City Veterinary College for two years before transferring to St. Joseph's.

★**John W. Salter** (MCK '13), 75, Dawson, Ga., died Jan. 16, 1960.

Dr. Salter was the first "Veterinarian of

the Year" in Georgia and a former president of the Georgia V.M.A. Among his survivors is a son, Dr. McTyier Salter (GA '54), a Dawson veterinarian also.

Wilbur G. Songer (KCV '10), 74, Lincoln, Kan., died March 7, 1959, after a long illness.

Dr. Songer had practiced in Lincoln with the exception of two years (1935-1937) when he engaged in tuberculosis eradication for the former BAI in Louisiana, Nebraska, and Kansas. At one time, he operated a scientific stock farm with Dr. L. C. Songer (KCV '03).

★**Dorsey M. Swinehart** (OSU '10), 77, Elida, Ohio, died Jan. 14, 1960, after a long illness.

Dr. Swinehart, a life member of the AVMA since 1955, had practiced in the Elida area for over 30 years and at one time had been state veterinarian.

★**Michael Whitmore** (EDN '56), 27, Walpole, N.H., died Dec. 19, 1960, following an illness of several months' duration.

Born in Bedford, England, Dr. Whitmore came to the United States in 1957 to join Dr. I. Tucker Burr (COR '51) in a Walpole practice.

★**Dale A. Wiley** (UP '48), 38, Jarrettsville, Md., died following a heart attack, Jan. 22, 1960.

Dr. Wiley was a past-president of the Maryland V.M.A. (1957-1958) and a member of the American Association of Equine Practitioners. He had been in practice in the Jarrettsville area for 10 years.

Among his survivors are two veterinarians: his father, Dr. J. Ross Wiley (UP '17) of Wellsboro, Pa.; and his brother, Dr. James R. Wiley (UP '41) of Myerstown, Pa.

• • •

Other Deaths Reported.—The following deaths have been reported. Information for an obituary was not supplied.

Thomas H. Jagger (ONT '10), North Vancouver, B.C., died Sept. 20, 1958.

Morley A. Jull, 74, died sometime in October, 1959.

Lorne D. Swenerton (ONT '02), Vancouver, B.C., Can., died Oct. 24, 1958.

Women's Auxiliary

Auxiliary Projects

Does your Auxiliary have a special project? Does it have more than one? What is the status of your attendance at meetings—good or poor?

How you answer the above questions may pinpoint how your group feels about their membership in the A.V.M.A. Auxiliary. Ever so often I hear some Auxiliary member ask, "Why should I attend meetings? What is there to do?"

All of us on the Auxiliary Executive Board appreciate the financial support most of you have given to the A.V.M.A. Auxiliary projects, e.g.—the Research Fund and the Student Loan and Memorial Fund. However, what you do in your local group to keep your membership interested, is what counts most over the years.

Should you need suggestions for social

activities, you might like to consider some of the following programs: book reviews, (especially those with veterinary medicine as a theme), travel talks, gardening, flower and table arrangements, fashion shows, beauty aids, home decorations, musical contributions, and card parties.

If you would like to augment your treasury, you might like to support a surplus instrument sale; compile a cook book assembled from recipes submitted by your membership; hold a candy, baked goods sale, an auction, or white elephant sale.

Regardless of the age of your membership, perhaps your Auxiliary would benefit from a talk on office bookkeeping methods, office and telephone manners, and simple laboratory procedures. Try a panel discussion with your own members contributing.

Have you ever invited one of the A.V.M.A. officers to attend your meeting, especially when he is appearing on the men's program? He would be happy and willing to talk to the women at their meeting, wherever possible. Don't overlook inviting him.

If any of you have had experience with projects that have proved successful in your area, won't you share them with the rest of us? This is the way we all learn that we may, in turn, benefit the entire profession.

s/Mrs. E. A. (MARION) WOELFFER, Retiring
President of the AVMA Auxiliary.

Georgia

ATLANTA.—A meeting of the Women's Auxiliary to the Georgia V.M.A. was held at the Heart of Atlanta Motel on Dec. 4, 1959, in connection with the State Associa-

tion's annual business meeting. Another program was planned for the June meeting scheduled for Jekyll Island, June 19—21, 1960.

The Auxiliary has sent letters to each

The Women's Auxiliary to the Georgia V.M.A. Left to right (front row) —Mrs. C. J. Mikel, vice-president; Mrs. M. E. Nunnery, treasurer; Mrs. J. T. Hart, president-elect. Second row—Mrs. G. L. Foy, member; Mrs. H. G. Blalock Jr., president; Mrs. F. E. Wilhite, secretary.





The newly elected roster of the Women's Auxiliary to the Missouri V.M.A.

Left to right—Mrs. Burl Z. Pfander, historian; Mrs. Frank Sutton, treasurer; Mrs. J. K. Farrell, president-elect; Mrs. George Murphy, president; Mrs. Wayne B. Chapin, vice-president; Mrs. L. N. Atkinson, secretary.

Georgia V.M.A. member's wife who is not yet a member of the Auxiliary—urging her to join. The letter outlines activities and shows how the Auxiliary's money is used.

The Student Chapter of the Auxiliary at Athens, is planning a booth for the June Jekyll Island meeting to raise funds. The wives of 1960 graduates were presented with complimentary membership to the Auxiliary for the remainder of the year at their February meeting in Athens.

s/Mrs. C. J. Mikel, *First Vice-President*.

Illinois

SPRINGFIELD—CENTRAL ILLINOIS AUXILIARY ELECTS NEW ROSTER.—Elected to serve the Women's Auxiliary to the Central Illinois V.M.A. for 1960 are: Mrs. D. W. Moreland, Springfield, president; Mrs. T. M. Folkerts, Springfield, president-elect; and Mrs. H. F. Bennett, Petersburg, secretary-treasurer.—*Ill. Vet. Bull.*, 14, (Oct.-Dec., 1959:) 4.

Missouri

KANSAS CITY.—The Women's Auxiliary to the Missouri V.M.A. held its annual meeting, Feb. 21-23, 1960, at the President Hotel.

A brunch was attended by 88 members in the Aztec Room. Mrs. E. E. Leasure, Man-

hattan, Kan., president-elect of the Women's Auxiliary to the AVMA was the guest of honor. For entertainment, Mrs. Thomas Franklin, Independence, presented a well-illustrated and vivid talk on her tour of Europe. Mrs. Paul Spencer, Jefferson City, president, presided at the business meeting. She challenged each member to bring in one new member for the coming year.

The following officers were elected: Mrs. George Murphy, Kirkwood, president; Mrs. J. K. Farrell, Boonville, president-elect; Mrs. Wayne B. Chapin, Mt. Vernon, vice-president; Mrs. L. N. Atkinson, Kirkwood, secretary; Mrs. Frank Sutton, Mexico, treasurer; and Mrs. Burl Z. Pfander, Springfield, historian.

Ohio

COLUMBUS.—The annual meeting of the Women's Auxiliary to the Ohio State V.M.A. was held at the Deshler Hilton Hotel, February 2.

One hundred and sixty women enjoyed a luncheon and hat show amid a French setting which depicted the Left Bank of the Seine River in Paris. Highlights of the meeting included public relation reports from local and regional auxiliaries. The women also discussed plans to sell Christmas cards this year in a PR program to further veterinary medicine.

s/Mrs. P. B. JOHNSTON, *Secretary*.



Officers of the Women's Auxiliary to the Ohio State V.M.A. are as follows: left to right—Mrs. Howard Deacon, Eaton, past-president; Mrs. R. J. Custis, New Vienna, vice-president; Mrs. Ben Henson, Mansfield, treasurer; Mrs. Harry Roberts, Cleveland, president; Mrs. P. B. Johnston, Cincinnati, secretary.

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**PENETRATION OF CHLORAMPHENICOL
U.S.P. (CHLOROMYCETIN) INTO THE EYE**
by Irving H. Leopold, Anna C. Nichols and
Adolph W. Vogel. *Arch. Ophthalmology*,
44: 22 (July) 1950.

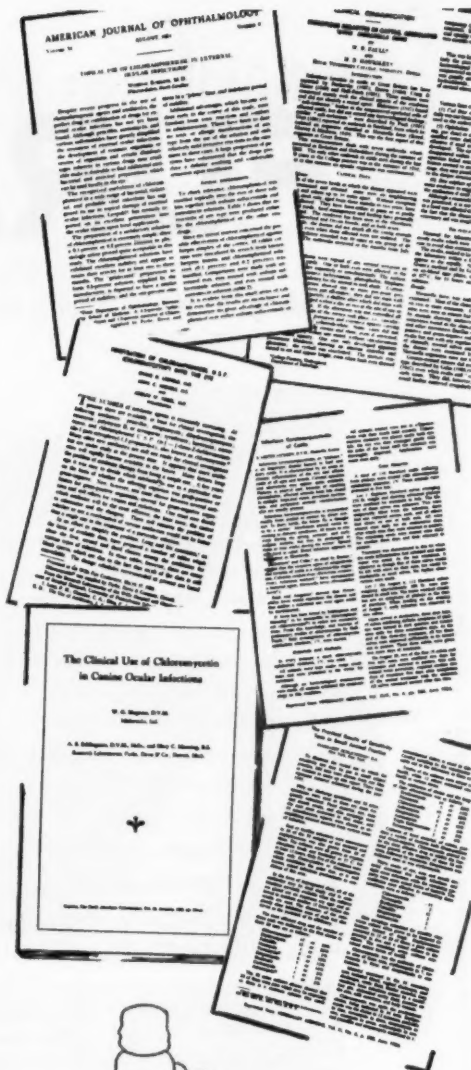
**INFECTIOUS KERATOCONJUNCTIVITIS OF
CATTLE**
by S. Lester Jackson. *Vet. Med.*, 49: 260
(June) 1954.

**THE PRACTICAL RESULTS OF SENSITIVITY
TESTS IN SMALL ANIMAL PRACTICE**
by Margaret Schlichting. *Vet. Med.*, 51: 280
(June) 1956.

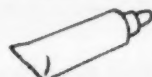
**TOPICAL USE OF CHLORAMPHENICOL IN
EXTERNAL OCULAR INFECTIONS**
by Winston Roberts. *Am. J. Ophthalmology*,
34: 1081 (Aug.) 1951.

**THE CLINICAL USE OF CHLOROMYCETIN
IN CANINE OCULAR INFECTIONS**
by W. G. Magrane, A. S. Schlingman and
Mary C. Manning. *North Am. Vet.*, 34: 39
(Jan.) 1953.

**INFECTIOUS KERATITIS IN CATTLE,
ASSOCIATED WITH MORAXELLA BOVIS**
by W. B. Faull and M. B. Hawksley. *Vet. Rec.*,
66: 311 (May 29) 1954.



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WHAT IS YOUR *Diagnosis?*

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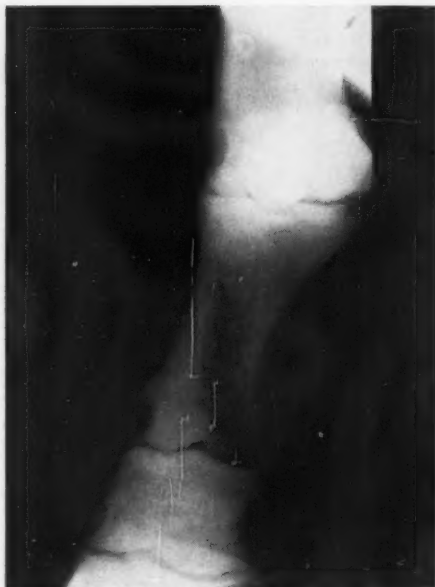


Fig. 1 — Posteroanterior (left) and medial radiographs of the left foreleg of the horse.

History.—This 5-year-old American Saddle horse stallion had injured his left foreleg just above the hoof when 2 days old. He was again favoring the limb and there was a swelling just above the front of the hoof. Posteroanterior and medial radiographs were taken (fig. 1).

Here Is the Diagnosis

(Continued from preceding page)



Diagnosis.—Fractured first phalanx with detached fragment.

Comment.—An old nonunion fracture of anterior part of the medial condyle of the first phalanx is revealed. The fracture surfaces and edges are smooth and rounded, indicating a long duration. A medial, posteroanterior oblique view (fig. 2) was helpful in demonstrating the full extent of this fracture.

No treatment was attempted. The significance of the fracture was questionable inasmuch as the joint surfaces were smooth and the joint spaces were well preserved.

This report was submitted by William D. Carlson, D.V.M., Ph.D., radiologist, College of Veterinary Medicine, Colorado State University, Fort Collins.

Our readers are invited to submit histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

Fig. 2 — This medial posteroanterior oblique view of the horse's foreleg shows full extent of the fracture.

Quiz for Quidnuncs

1. What are the predominant signs of advanced prostate disease in the dog? Page 486.
2. Of what value is cyanacethydrazide as a treatment for lungworms in sheep? Page 510.
3. Of what value is hygromycin as a treatment for fringed tapeworms in sheep? Page 507.
4. Given intramuscularly, how much longer will penicillin residues resulting from penicillin in oil preparations persist in cow's milk than residues from penicillin in aqueous suspension preparations? Page 480.
5. In treating trichomoniasis in bulls, what therapeutic agent was shown to be of most value? Page 504.
6. How may a diagnosis of myelogenous leukemia be established in a dog? Page 497.

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History of the AVMA

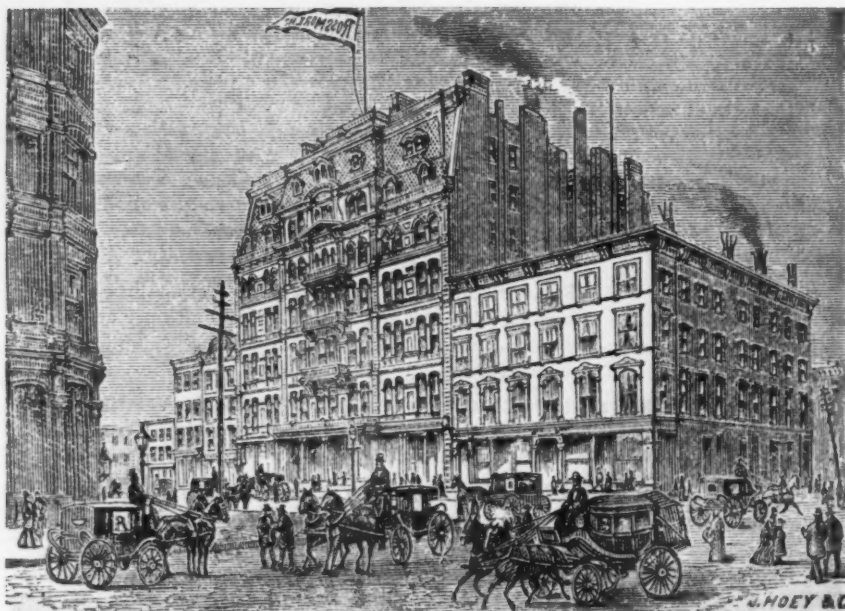
Although the quorum was present for the semiannual meeting in Boston, it was discovered that proper notification had not been made. Thus while technically there was no meeting for 1886, the day was spent in the presentation of cases and papers. The annual meeting was held at the Rossmore Hotel in New York, where about 40 members from six states were present.

Dr. Liautard, upon whose invitation (or insistence) the meetings had been held at the

all the members . . . In any case it proved to be a fairly interesting meeting . . . very much like its last predecessor, the time being almost wholly occupied in discussing the business of the Association."

Seventeen new members were admitted, including W. H. Lowe, a future president of the Association. It was voted to appropriate \$100 toward erecting a monument in honor of Henri Bouley, the late eminent French veterinarian. The Committee on Education was empowered to spend up to \$150 for its work.

1886



The Rossmore Hotel in New York, site of the 1886 annual meeting of the AVMA.

American Veterinary College in late years, expressed surprise that "this selection was made in preference to one of the numerous appropriate halls, where similar scientific bodies are accustomed to find accommodations . . . Why a room was not engaged in the Academy of Medicine . . . or why the lecture rooms of one of the two veterinary colleges of this city were overlooked is not very clear to the minds of

At this time, the treasury of the Association contained about \$700.

Dr. McLean, on retiring from the chair, "regretted that individual members took so little interest in the welfare of the Association, and did so little to advance the profession."

A \$50 prize was awarded to Tait Butler for his essay on "Parturient Apoplexy." Although

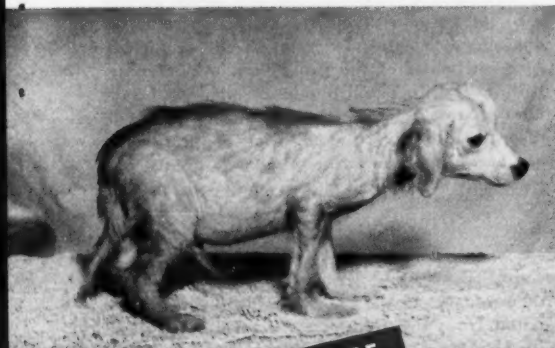
(Continued on adv. p. 42)

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1. "Clinical Evaluation of a Drug for Dermatoses of Dogs and Cats," Wenger, J. B., Vet. Med., 55:55-58, Mar. 1960.

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two contending papers earlier had been published anonymously in the *Review*, it was decided to have them read at the meeting, "as the committee . . . had failed to report, and . . . a number of the members present had not read the articles." After voting on the papers and finding the winning one to be by Tait Butler, "a rather unpleasant surprise was experienced by a portion of the members when the fact was learned that the successful essayist was not an American but a Canadian graduate, nor a member of the Association. There was, however, no alternative—the situation must be accepted." Fortunately, the rules governing the prize stipulated only that the essayist be a veterinarian.

It may be surmised that this incident helped lead to a fuller appreciation of the interdependence of the veterinary professions of Canada and the United States. In writing on "Parturient Apoplexy," Dr. Butler notes: "There is perhaps no disease to which bovine flesh is heir concerning the etiology and pathology of which there is less definite knowledge and greater diversity of opinion." And in presenting an effective rebuttal to the theory of F. S. Billings contending that milk fever in cattle is identical with parturient eclampsia in women, he observes: ". . . the wholesale system of adoption [of human medical theories] practised by many writers on veterinary medicine has led to grave and unpardonable errors, and has been chiefly instrumental in bringing about a lack of independence of thought and original investigation."

It is perhaps not too invidious to note that while Butler, who had graduated from the Ontario school only a year before, later became an AVMA president, Billings was shortly expelled from membership for, among other things, voicing his untenable opinions in an unbecoming manner.

Dr. Liautard, who had served as president of the Association from 1875-1877, was again elected to this office. William Zuill was elected vice-president, and Drs. Robertson and Michener re-elected treasurer and secretary.

The great hog cholera controversy between Salmon and Billings was raging at this time. In 1887, the *Review* purported to publish "communications on the subject . . . from the pens of Dr. Billings [70 pages] and Dr. Salmon" (4 pages). And while Liautard deplored "the feelings of hostility which have been generated," he perhaps was smarting a little over Salmon's reproving him for stating that *rouget* (hemor-

rhagic septicemia) and hog cholera were identical, and that the means existed for preventing both by inoculation.

On the basis of six months' work, Billings had declared that hog cholera "was not contagious . . . [but] was a local disease," and asserted: "The time will surely come when either Salmon or I will have to take a back seat . . . and the world will know who is right, honest, and consistent." Liautard, whose espousal of Billings' cause was already tending to damage confidence of the profession in the work of Salmon and the BAI, avers: "Dr. B. does good work, and deserves well for his labors on behalf of the profession." Concerning Billings' "diffuse and bombastic writings," Salmon observes: ". . . they are the product of a disordered brain. If the editorials of the *Review* are based upon such literature . . . I must occasionally interpose with a mild objection."

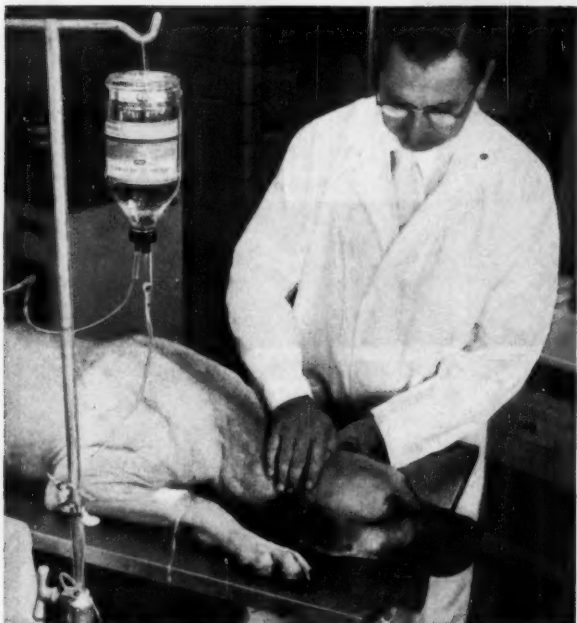


LACHLAN McLEAN, M.R.C.V.S., 13th President of the USVMA (1885-1886), was graduated from the Edinburgh Veterinary College in 1854 and qualified as a member of the Royal College of Veterinary Surgeons in 1880. After practicing in Scotland, he went to Canada to work for the British Government. Later, he came to the States, and in 1866 founded the Brooklyn Veterinary Hospital where he practiced until 1914. The hospital was the oldest in continuous operation in the United States. During McLean's 48-year tenure he kept it open 24 hours a day and is reputed to have never refused a call.

In 1879 he was appointed a special Veterinary Inspector to the Board of Health of Brooklyn, apparently the first such appointment in the country. In 1884 the posts of Veterinary and Food Inspector, and of Assistant Inspector were created. The latter was filled by his son, Roderick A. McLean, after a competitive examination conducted by Dr. Liautard and four physicians. The elder McLean outlived his son by 25 years, and died at about 1920 at the age of 94.

Concerning his work, he urged in 1885: "The practice of some Boards of Health, in employing medical men to do the work of the veterinary sanitarian, is not creditable to either profession . . . Let our profession so advance that we will be considered an indispensable part of every well-organized department of health, for not alone local but also national interests depend upon the vigilance and painstaking of the qualified veterinary sanitarian."

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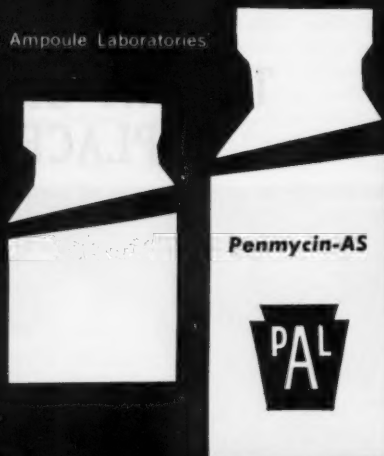
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Dr. Bjork Elected Chairman of AVMA Council on Veterinary Service

At the meeting of the Council on Veterinary Services in Chicago on Nov. 29-30, 1959, Dr. C. A. Bjork of Portland, Ore., was elected chairman. Dr. Kenneth Whittington of Memphis was elected secretary. Other members of the Council are: Drs. R. O. Anderson, Elkhorn, Wis.; F. T. Candlin, Denver, Colo.; A. H. Groth, Columbia, Mo.; J. A. Henderson, Ankeny, Iowa; H. J. Hill, Denver, Colo.; J. L. McAuliff, Cortland, N. Y.; A. G. Misener, Chicago, Ill.; and C. L. Nelson, Jewell, Iowa.

Following a hearing with representatives of the Greater St. Louis Veterinary Medical Association, the Council passed a motion recommending that the Judicial Council "... reaffirm a policy of ethical conduct to be followed by veterinarians who may be employed by humane organizations and other corporations so that unfair advantage of private veterinary practitioners can be avoided."

Dr. Candlin was named chairman of the committee to study relations between humane associations and veterinarians. This committee will propose that the following modifications be made in the 1928 AVMA-American Humane Association Agreement:

- 1) There should exist at all times an honest and most loyal cooperation with veterinarians and humane societies.
- 2) That humane societies should endeavor, in the building of their work, to avoid conflict with the development of veterinary medicine.
- 3) That the Humane Society should continue to emphasize the importance of the humane and kind treatment of all animals and that in localities where the veterinary profession is unable to or neglects to provide facilities for this being done, that is biologically, it rests upon the humane society to undertake the task.

The Council also heard reports by the joint AVMA-ADSA (American Dairy Science Assn.) Committee, the Committee on Biological and Pharmaceutical Supply Problem, the representative to the National Brucellosis Committee, and the representative to the American Humane Association.

A new booklet, sponsored by the Council,

prepared through AVMA-AAHA cooperation, and pertaining to the training of receptionists, was examined and approved.

Following a discussion of the financial plight of Livestock Conservation, Inc., and the advisability of the AVMA's assuming leadership of the various groups involved in hog cholera, brucellosis, and cattle grub elimination, a committee was appointed (Dr. Hill, chairman) to investigate.

With respect to the mail order sale of dogs, the Council noted that 1 of its members is preparing a pertinent manual.

Dr. Henderson was named chairman of the Committee on the Veterinary Practice Aspects of Drug Use in Animal Medicine, following Council discussion of the effect, on meat and milk, of herbicides, pesticides, and antibiotics.

Dr. McAuliff was named chairman of the Committee to the National Association of Artificial Breeders.

The Council discussed the use of therapeutic dog foods and considered the question of their regulation and licensure. This matter was referred to the Council on Biologic and Therapeutic Agents.

CHECK . . .

August 14-18, 1960 for the
AVMA Annual Meeting in
Denver, Colorado

Hotel information and appli-
cation blanks on
adv. p. 64-66 of this issue



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Proposed Amendments to the Bylaws

The following amendments are published in accordance with Article XI of the Bylaws and will, therefore, be in order for final action at the 1960 session of the House of Delegates.

New Proposals

AMENDMENT No. 1

Amend Article V, Section 4, paragraph (b), to read:

b) The Council shall:

i) Serve as a coordinating and correlating body in matters pertaining to veterinary medical research.

ii) Develop plans, projects and a fellowship program for the purpose of encouraging scientific development in the veterinary profession. Graduate study by veterinarians and by students in colleges of veterinary medicine who have completed at least two years toward the D.V.M. degree, and who are currently eligible for graduate study, may be assisted financially through the fellowship program.

iii) In collaboration with the editor-in-chief, determine broad policies, concerning the *American Journal of Veterinary Research*, subject to approval of the Executive Board. Members of the Council and other reviewers designated by the Council will assist the editor-in-chief in the evaluation of manuscripts submitted for publication.

AMENDMENT No. 2

Amend Article V, Section 6, paragraph (b)

by deleting the word "proprietary" from the first line of paragraph ii);

by adding the word "biologic," immediately preceding the word "drug" in the sixth line of paragraph (iii), i.e., "products from the biologic, drug and food markets."

AMENDMENT No. 3

Amend Article V, Section 7, by adding the following to paragraph (b):

v) Recommend and encourage the development and support of programs designed to prevent, control and eradicate animal diseases at the local, state and national level, with the participation of local practitioners.

vi) Keep before the profession the responsibilities shared by all veterinarians to (a) safeguard animal and human health by diagnosing and reporting "reportable" diseases; (b) meet all applicable requirements in certifying to the health of animals; and (c) participate in accordance with applicable regulations in organized programs for the prevention, control and eradication of animal diseases.

AMENDMENT No. 4

Amend Article VIII, Section 6, to read: *Scientific Program.* — (a) — Division into Sections: For the purposes of the scientific program conducted as a part of the annual session, the Association shall be divided into the following sections:

Large Animals
Research
Small Animals
Public Health and Regulatory
Veterinary Medicine
Poultry

Each Section shall have a chairman and secretary chosen by the president from a list of nominations submitted by the members attending the section meeting or, in lieu of such nominations, by direct appointment.

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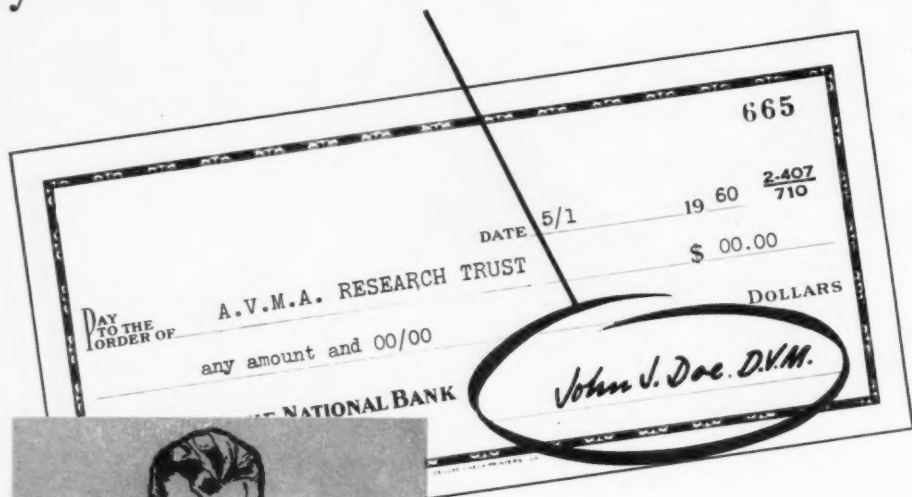
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APPLICATIONS

Applicants Not Members of Constituent Associations

In accordance with paragraph (c) of Section 1, Article I, of the Bylaws, the names of applicants who are not members of constituent associations shall be published in the JOURNAL. Written comments received by the Executive Secretary from any active member regarding the application as published, will be furnished to the Judicial Council for its consideration prior to acceptance of the application.

REDMAN, HAMILTON C.

708 Kentucky, S.E.
Albuquerque, N. M.
D.V.M., University of California, 1959.
Vouchers: John L. Terry, Jr., and William H. Pryor, Jr.

HAINES, WILLIAM A.

167th Medical Detachment (VFI)
APO 154, New York, N. Y.
D.V.M., University of Pennsylvania, 1939.
Vouchers: C. W. Betzold and Charles B. Frank.

MURTY, DEVARAKONDA K.

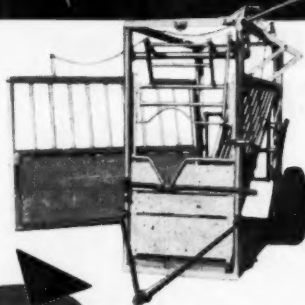
U.P. College of Veterinary Science and Animal Husbandry
Mathura, Uttar Pradesh, India
B.V.Sc., Madras University, 1943.
Vouchers: C. A. Brandy and J. O. Alberts.

Tapeworm Therapy in Man

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Vomiting occurred more often in quinacrine-treated patients (8.0%) than in those given aspidium oleoresin (3.5%). Quinacrine should be avoided in patients with *Taenia solium* infections, because vomiting may result in cysticercosis.—*Brit. M. J.*, (Sept. 26, 1959): 542.



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COMING MEETINGS

Notices of coming meetings must be received 30 days before date of publication.

Kansas State University. Twenty-second annual conference. School of Veterinary Medicine, Kansas State University, Manhattan, May 19-21, Donald C. Kelley, chairman.

Michigan State Veterinary Medical Association. Annual summer meeting. Pantlind Hotel, Grand Rapids, Mich., June 14-16, 1960. John J. Godisak, Coopersville, Mich., chairman.

Purdue University. International symposium on growth: molecule, cell, and organism. Purdue University, Lafayette, Ind., June 16-18, 1960. For additional information, write: Dr. M. X. Zarrow, Department of Biological Sciences, Life Science Building, Purdue University, Lafayette, Ind.

Georgia Veterinary Medical Association. Fifty-fourth annual meeting. Jekyll Island, Ga., June 19-21, 1960. A. M. Mills, 325 Pinecrest Dr., Athens, Ga., secretary.

Mississippi State Veterinary Medical Association, Inc. Annual meeting. King Edward Hotel, Jackson, June 19, 1960. Joseph W. Branson, P. O. Box 4223, Fondren Sta., Jackson, Miss., secretary-treasurer.

North Carolina Veterinary Medical Association. Fifty-ninth annual summer meeting. Grove Park Inn, Asheville, June 21-23, 1960. J. T. Dixon, 3026 South Main St., Winston-Salem, N.C., secretary-treasurer.

California Veterinary Medical Association. Seventy-second annual meeting. Jack Tar Hotel, San Francisco, Calif., June 26-29, 1960. Mr. Ken Humphreys, 3004 16th St., San Francisco 3, Calif., executive secretary.

Iowa State University. Annual conference for veterinarians. Memorial Union, Iowa State University, Ames, July 12-13, 1960. Address the program committee at Iowa State for additional information.

Virginia Veterinary Medical Association. Summer meeting. Shoreham Hotel, Washington, D.C., July 17-19, 1960. G. B. Estes, State Office Building, Richmond, Va., secretary-treasurer.

Kentucky Veterinary Medical Association. Forty-ninth annual convention. Sheraton-Seelbach Hotel, Louisville, July 18-19, 1960. L. S. Shirrell, 545 East Main, Frankfort, Ky., secretary.

Auburn University. Fifty-third annual conference for veterinarians. School of Veterinary Medicine, Auburn University, July 24-27, 1960. J. E. Greene, dean.

Canadian Veterinary Medical Association. Twelfth annual meeting. Halifax, Nova Scotia, July 24-27, 1960. For reservations, write: Dr. M. D. Harlow, Box 1153, Halifax, Nova Scotia, Can.

Louisiana Veterinary Medical Association, Inc. Annual meeting. Monteleone Hotel, New Orleans, Aug. 1-2, 1960. Robert K. Morris, 406 W. McNeese St., Lake Charles, La., secretary.

American Association of Veterinary Bacteriologists. Annual meeting. Division of Veterinary Science, University of Wyoming, Laramie, Wyo., Aug. 13, 1960. Charles H. Cunningham, Department of Microbiology and Public Health, Michigan State University, East Lansing, Mich., secretary.

(Continued on adv. p. 54)

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(Continued from adv. p. 52)

Eastern Iowa Veterinary Association, Inc. Forty-seventh annual meeting. Hotel Montrose, Cedar Rapids, Oct. 13-14, 1960. Grant B. Munger, 1921 First Ave., S. E., Cedar Rapids, Iowa, secretary.

American Veterinary Medical Association. Ninety-seventh annual meeting. Denver-Hilton Hotel, Denver, Colo., Aug. 15-18, 1960. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Armed Forces Institute of Pathology. Seventh annual course. Armed Forces Institute of Pathology, Washington, D.C., Sept. 26-30, 1960. Deadline for applications is August 15. To apply, write: The Director, Armed Forces Institute of Pathology, Washington 25, D.C.

Gaines Dog Research Center. Tenth annual symposium. Kankakee Civic Auditorium, Kankakee, Ill., Oct. 12, 1960. Dean C. A. Brandly, School of Veterinary Medicine, University of Illinois, Urbana, Ill., chairman.

Southern Veterinary Medical Association, Inc. Annual meeting. Francis Marion Hotel, Charleston, S.C., Oct. 23-26, 1960. Otto M. Strock, 461 Maybank Highway, Charleston, S.C., general chairman.

Animal Care Panel. Annual convention. Sheraton-Jefferson Hotel, St. Louis, Mo., Oct. 26-28, 1960. Herbert Graft, 835 S. 8th St., St. Louis, Mo., convention secretary.

Foreign Meetings

International Congress of Physio-Pathology of Animal Reproduction and Artificial Insemination, Amsterdam, Netherlands, June 13-17, 1960. Dr. J. Edwards, Milk Marketing Board, Thames, Surrey, England.

First International Congress of Endocrinology. Technical University of Denmark, Copenhagen, July 18-23, 1960. Dr. Christian Hamburger, Statens Seruminstitut, Copenhagen S, Denmark, chairman of the executive committee.

(Continued on adv. p. 56)

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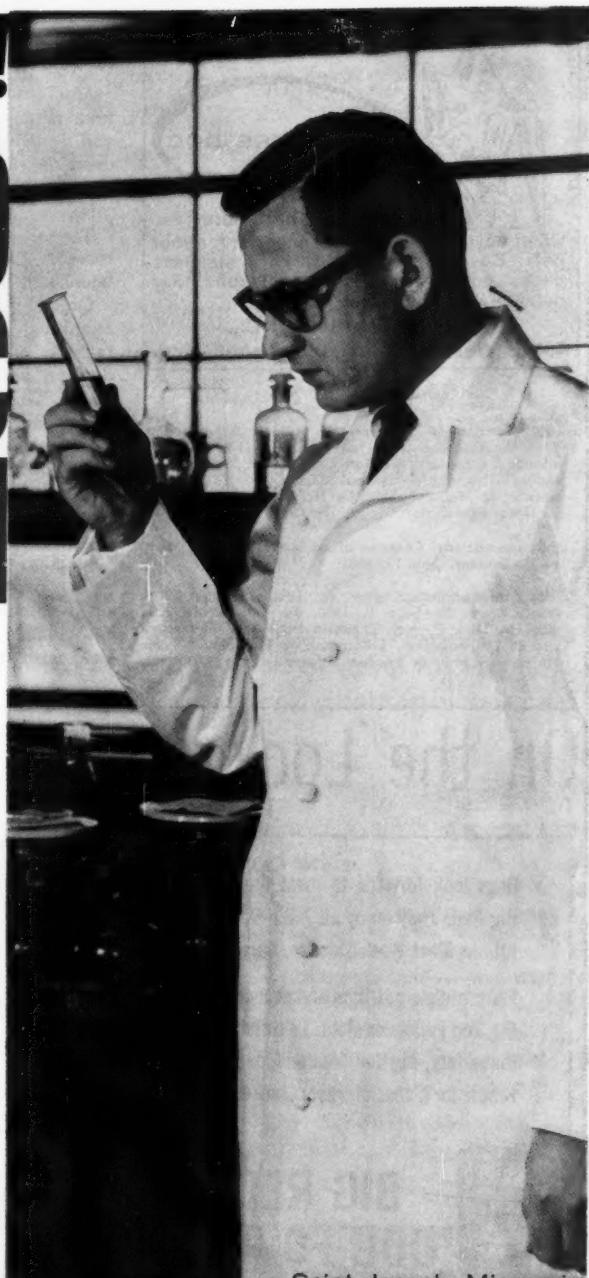
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(Continued from adv. p. 54)

Fourth International Congress on Animal Reproduction. The Hague, Netherlands, June 5-9, 1961. For additional information contact: the Secretariat of the Fourth International Congress on Animal Reproduction, 14, Burge-meester de Monchyplein, The Hague, Netherlands, Dr. L. Hoedemaker, secretary to the organizing committee.

Eighth International Congress of Animal Husbandry. Hamburg, Germany, June 13, 1961.

Second International Course on Lyophilization. Lyon, France, Aug. 29—Sept. 9, 1960. For full details, contact: Dr. Louis R. Rey, Directeur des Cours Internationaux de Lyophilisation, Laboratoire de Physiologie, Ecole Normale Supérieure 24, rue Lhomond, Paris 5, France.

Livestock Disease Problems — Feature to Be Continued in 1960

Most veterinarians will recall the feature articles on livestock disease problems and veterinary medical service, which were used so widely in farm magazines across the country last year as part of the effort sponsored by Associated Veterinary Labs.

These articles are being continued through 1960, according to plans which have been announced.

One major livestock disease topic will be examined in each month's farm magazine feature, and the role of the veterinarian in dealing with the problem will be emphasized. The copy will be released through American Foundation for Animal Health, as was the case last year.

In addition, the campaign of public education will include releases throughout the year to daily and weekly newspapers, farm editors of radio stations, and a series of television programs, released nationally.

The project is designed to focus attention on livestock disease problems, and stress the importance of calling in a veterinarian to deal with these problems.

On the Lookout for **BIG RED**

Dogs look forward to meal time when you feed Big Red. They enjoy all 7 Big Red Foods—Pellets, Kibble, Meal, Beef, Chicken, Horsemeat and Ration.

For complete nutrition and economy, you can't beat Big Red Pellets or Meal. To satisfy your dogs' need for variety, Big Red Canned Meats hit the spot. Try Kibble for a special treat; Chicken for fussy eaters.



**BIG RED
DOG FOODS**



AT YOUR LOCAL G.L.F. STORE OR WRITE:
BOX 343, CANANDAIGUA, N. Y.



**QUICK,
EFFECTIVE
TREATMENT
FOR
TOPICAL
INFECTIONS**

KERASPRAY®

Keraspray provides 4 potent antibacterials, plus a local anesthetic. This broad antibacterial activity makes it especially useful as a topical dressing following closure of surgical incisions, dehorning and castration.

In the easy-to-use plastic insufflator, Keraspray offers effective therapy for infected wounds, ear and eye infections—specifically keratitis.



in
large
AND
small
animals



Each Gm. contains:

Neomycin sulfate . . . 0.25%
Phenylmercuric nitrate . 0.005%
Sulfanilamide 86.25%
Sulfisoxazole 10.0%
Tetracaine hydrochloride 0.5%

Supply: 5 Gm., 14 Gm. and 30 Gm. plastic insufflators.

**ONE PUFF
IS USUALLY ENOUGH**

THE S. E. MASSENGILL COMPANY

**Veterinary Division
BRISTOL, TENNESSEE**





with **Pard** ...high in Meat Protein

If you are reading this magazine, it's safe to conclude that you are concerned with the welfare of dogs—both personally and professionally.

Swift's staff of Research Veterinarians and Nutritionists share your interest in the good health of dogs. You can trust their concern, their care, their sense of responsibility for your dogs' nutrition to be as sincere as your own. That is why you can feed or recommend any type of Pard, with confidence.

A dog instinctively prefers foods which have liberal quantities of animal proteins, and every Pard product supplies—in just the right ratio—all the nutrients dogs need. As you know only too well, just one amino acid deficiency can cause the failure of the entire diet. All Pard products—whether canned or dry—contain all ten of the essential amino acids.

The meat meal, soy, fish, and milk by-products used in Pard

Crunchers are the richest natural sources of the amino acids required by dogs.

In canned Pard—regular or with Beef Gravy—the meat used is beef, together with beef by-products—supplemented, of course, with soy grits, cereal, yeast and minerals for protein balance, carbohydrate energy, vitamins and minerals. That's why we say "beef up" your dog diets with Pard—high in meat protein.

LIKE YOU . . . SWIFT RESEARCH VETERINARIANS ARE DEDICATED TO THE HEALTH AND HAPPINESS OF DOGS

PARD CRUNCHERS
with Beef Gravy
Economy in 20- and 50-lb. bags and smaller sizes. Mixes quickly and cleanly.



Swift
105TH YEAR
To Serve Your Profession Better



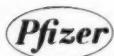
NOW two kinds
of Pard in cans
Variety—alternate regular Pard and new Pard with Beef Gravy.

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The
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Solution
for
Broad—Fast—Successful
Antibacterial
Therapy



Science for the world's well-being TM

Liquamycin Injectable

oxytetracycline solution

Get-Acquainted Offer*

Discover the effectiveness, convenience, and economy of Liquamycin Injectable during a special **get-acquainted offer**.

For a limited time the practical solution will be available in a combination package. A dispensing 50 cc. vial will be provided at **no charge** with each purchase of a 500 cc. vial of Liquamycin Injectable.

*This offer will be available only during a limited introductory period.

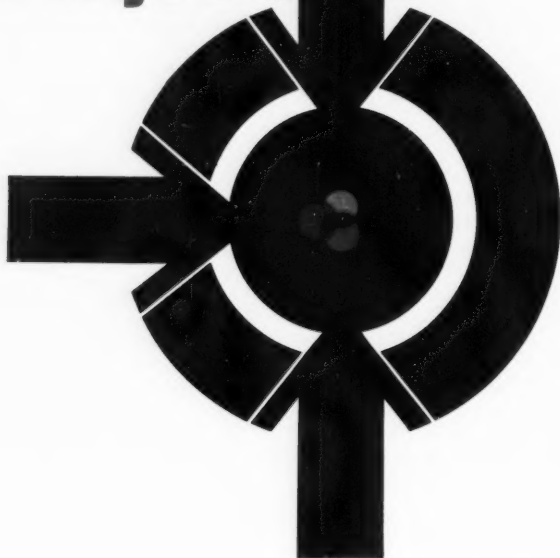


Packaging—

- amber vials of 50 cc. containing 2.5 Gm. of oxytetracycline hydrochloride.
- amber bottles of 500 cc. containing 25 Gm. of oxytetracycline hydrochloride.

Administration and Dosage

Liquamycin Injectable may be administered intravenously, subcutaneously, and intramuscularly. 1 to 2 mg. per pound of body weight is usually sufficient for satisfactory therapy in cattle, sheep and swine. Dosage may be increased up to 5 mg. per pound in severely affected or young animals. See the package insert for more detailed instructions.



Department of Veterinary Medicine Chas. Pfizer & Co., Inc. New York, New York

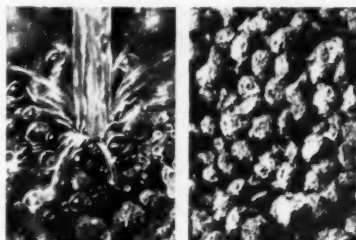
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**Now perfected for professional feeding.
Look! Mixes better than kibble.**



**Gaines Meal . . . hours after mixing
with the hottest water—still holds
shape . . . no caking or mushing.**

Box 000
Gaines Professional
Service Dept.
275 Cliff St.
Battle Creek, Mich.

Gentlemen: Please send
me my Gaines Kennel Plan
application blank—plus
details on the Kennel Aids
I receive free when I join.

Name _____

Name of kennel (if any) _____

Address _____

City _____ Zone _____ State _____

Offer not good in Kansas or outside U. S.



MAP OF DOWNTOWN DENVER



If we can be of further service during your stay in Denver ... please call upon us.

Denver Convention and Visitors Bureau

225 West Colfax Ave.
Telephone
ACome 2-0671

HOTEL INFORMATION—DENVER, COLORADO, CONVENTION

Ninety-Seventh Annual AVMA Meeting, Aug. 14-18, 1960

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Denver Convention and Visitors Bureau. The Bureau will clear all requests and confirm reservations.

Hotel and Rate Schedule

(See Location, by Number, on Map of Downtown Area)

Map No.	Hotel	Single (1 person)	Double bed (2 persons)	Twin bed (2 persons)	Suites	Sets-2 rooms connecting bath (2-3-4 persons)
1	Adams*	\$5.50-7.50	\$ 7.50-9.00	\$ 8.50-10.50	\$13.50-15.00	\$ 9.50-16.00 (1 Room, 2dbl. beds)
2	Albany†	6.50-9.50	10.00-12.00	12.50-14.00	30.00	- - - - -
3	Ambassador	5.50-6.00	7.00-7.50	9.00	- - - - -	- - - - -
4	Argonaut*†	6.50-9.50	8.50-11.00	9.50-12.50	- - - - -	13.50-17.50
5	Auditorium*	5.00	6.50	7.00	- - - - -	8.00-12.00
6	Broadway Plaza†	8.00-10.00	10.00-12.00	12.00-14.50	18.00-28.00	- - - - -
7	Brown Palace†	9.00-15.00	13.00-17.00	14.00-19.00	22.00-70.00	18.00-22.00
8	Colorado*	4.50-6.00	6.00-10.00	8.00-12.00	- - - - -	14.00-20.00
9	Cory	5.00-7.00	6.00-9.00	6.50-9.00	- - - - -	- - - - -
10	Cosmopolitan*	8.50-11.00	12.00-18.00	14.00-20.00	22.00-60.00	- - - - -
11	Hillview	9.00-11.50	10.00-12.00	12.00-13.50	16.00-18.00	- - - - -
12	Hilton*†	HEADQUARTERS HOTEL — Reserved exclusively for official convention use.				
13	Kenmark (not a/c)	4.50-6.50	6.00-7.00	7.50-8.00	- - - - -	6.00-12.00
14	Mayflower*	7.50-14.50	8.50-16.50	12.50-18.50	- - - - -	- - - - -
15	Olin*	5.00-7.00	9.00-11.00	10.00-12.00	- - - - -	11.00-16.00
16	Oxford	5.00-10.00	6.50-10.00	8.50-11.00	13.00-16.00	- - - - -
17	Sears	5.00-6.00	6.50	7.50	- - - - -	14.00 (For 2-3-4 persons)
18	Shirley Savoy*	7.00-9.00	9.50-11.50	11.00-13.00	25.00	15.00-19.00

† 100 per cent air-conditioned; in other hotels listed, majority of rooms air-conditioned.

***FAMILY PLAN**—The above hotels offer a "family plan" whereby children under 12 years of age will be accommodated in the same room with their parents at no extra charge. If more than one room is required to accommodate children, the hotel will charge only the single rate for each room.

MOTELS—Reservations for motels in the Denver area may be made through the Denver Convention and Visitors Bureau, 225 West Colfax, Denver 2, Colo.

PLEASE USE APPLICATION ON REVERSE SIDE FOR HOTEL ACCOMMODATIONS

Application for Hotel Accommodations

1960 AVMA Convention — Denver, Colorado

The Convention and Visitors Bureau will make every effort to place you according to your expressed wishes or, if the accommodations of your choice are not available, the Housing Bureau will select one that is nearest to the preferred rate and location.

Please give us the complete information requested below. At least four choices of hotels, or more if you desire, are necessary. Arrange for double occupancy of rooms wherever possible; only a limited number of single rooms is available.

Date

Hotel First Choice

Hotel Second Choice

Hotel Third Choice

Hotel Fourth Choice

☐ Room with bath for one person. Rate per room desired \$..... to \$.....

☐ Room with bath for persons. Rate per room desired \$..... to \$.....

☐ double bed ☐ twin beds

☐ Two rooms with connecting bath for persons:

Rate per set desired \$..... to \$.....

☐ Suite with bedroom(s) with bath for persons:

Rate per suite desired \$..... to \$.....

☐ Check here if you desire accommodations on the FAMILY PLAN.

Arrival date, hour A.M. P.M.

Departure date

If reservations cannot be made in one of the hotels indicated shall we place you elsewhere? ☐ Yes ☐ No

If you have a few days before or after the convention that you would like to enjoy in the mountains please check the appropriate box to receive free information:

☐ Sightseeing trip ☐ Dude Ranches ☐ Resorts ☐ Housekeeping cabins

Rooms will be occupied by (NAMES OF ALL PARTIES MUST BE LISTED)

PLEASE PRINT

NAME	STREET ADDRESS	CITY	STATE

Name

Street Address

City State

MAIL TO: Convention and Visitors Bureau, 225 West Colfax Avenue, Denver 2, Colorado

Reservations will be confirmed directly to those who return this form and it should be received not later than July 25, 1960

Sparine[®] "...has brought considerable change in the management and treatment of animals"*

Promazine Hydrochloride, Wyeth

HYDROCHLORIDE



Weberlein and associates reported on the use of SPARINE in small animal practice. SPARINE was given to 249 dogs to facilitate examination and as an adjunct to local and general anesthetics. They found that SPARINE "... proved to be valuable in veterinary practice. The animal benefits by its use, the client is pleased and the veterinarian may work effectively."*

*Weberlein, M.K., et al.: J.A.V.M.A. 134:518-519 (June 1) 1959.

Wyeth Laboratories Philadelphia 1, Pa.



A Century
of Service

AVAILABLE: TABLETS: 25, 50, 100 mg., vials of 50,
INJECTION: 50 mg. per cc., vials of 10, 30,
and 100 cc.

For further information on prescribing and administering
SPARINE see descriptive literature, available on request.

SUPPLIED ONLY TO THE PROFESSIONS

CLASSIFIED ADVERTISEMENTS

PERSONAL WANT ADS—\$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

TOTAL WORD COUNT must include complete box number address (7 words) or personal address line.

COMMERCIAL WANT ADS—\$5.00 for the first 25 words, 25 cents for each additional word; \$1.00 for use of box number. (See paragraph above for total word count.)

Remittance must accompany ad.

DEADLINES

1st of month issue — 8th of month preceding date of issue.

15th of month issue — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

Wanted—Veterinarians

Wanted—assistant for mixed practice in Northeast. Opportunity for partnership or ownership by right party. Immediate employment available or will consider 1960 graduates. Replies confidential. Address Box E 55, JOURNAL of the AVMA.

Wanted—veterinarian for general practice in Wisconsin. Salary—\$650 per month. Automobile with mobile radio furnished. Address Box E 51, JOURNAL of the AVMA.

Wanted—relief veterinarian for mixed practice, predominately dairy cattle, for the month of August, 1960. Address Gerald Thorington, Rushford, N. Y.

Wanted—reliable, capable veterinarian for permanent affiliation with incorporated small animal group practice in Conn. Address Box E 4, JOURNAL of the AVMA.

Wanted—veterinarian for small animal hospital in metropolitan New York City. New York license required. Excellent opportunity for permanent position. Address Box E 13, JOURNAL of the AVMA.

CALIFORNIA STATE VETERINARY POSITIONS

Excellent opportunities in California State Government in either disease control and Pathology or Meat hygiene for Graduate Veterinarians with or without experience in practice. Salary range \$556-\$676. Senior veterinary students eligible to apply before graduation. Liberal employee benefits. Write at once for further information. CALIFORNIA STATE PERSONNEL BOARD, 801 Capitol Ave., Sacramento 14, California.

VETERINARIAN

Required for experimental surgery and care of animal colony in modern research laboratory of large ethical drug manufacturer in northern New Jersey. Send detailed resume & salary requirements.

Address Box E 62, JOURNAL of the AVMA.

Wanted—assistant for small animal hospital in St. Paul-Minneapolis area. State qualifications and personal background. Experience not necessary. Address Box E 18, JOURNAL of the AVMA.

Wanted—Positions

Individual experienced as plant manager, technical director, chief chemist, product development and production supervisor, desires position offering responsibility and challenge. Human or veterinary fields acceptable. Address Box E 63, JOURNAL of the AVMA.

Veterinarian, age 29, BS in agriculture, 3 years' practice experience, desires position in poultry field, meat production and hygiene, or something similar. Address Box E 56, JOURNAL of the AVMA.

Graduate (COL '58), married, fulfills service obligation in September, desires position with work and future, mixed or small animals. Licensed in Colorado, California, Kansas, Wyoming. Address Box E 54, JOURNAL of the AVMA.

Experienced relief veterinarian, Cornell graduate, available for Long Island area. Competent in every phase of small animal practice. Call Lincoln 1-4276.

Wanted—associate position in general practice in Kan., Neb., Ill., Iowa, Minn., or Wis. Graduate (KSC '59), married, completing active military duty June, 1960. Address Box E 11, JOURNAL of the AVMA.

Veterinarian, 1958 graduate, age 30, engaged in small animal practice, desires position with ethical pharmaceutical concern in sales and marketing with management future. Address Box E 14, JOURNAL of the AVMA.

Veterinarian with BS and MS degrees in animal husbandry, nutritional research and general practice experience, desires research position with college or commercial institution. Address Box E 50, JOURNAL of the AVMA.

Relief veterinarian available any evening after 4 P.M. Experienced with pet hospitals and large animals. Long Island only. Li. 1-9354.

Wanted—Practices

Wanted—two-man small animal practice in Pacific Northwest, preferable state of Washington. Have capital available. Each man has 12 years' experience. Address Box E 57, JOURNAL of the AVMA.

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DEPENDING ON YOU AND...



HOG CHOLERA VACCINE

KANSAS CITY, KANS.

FIFTY NO. SECOND ST.

Recent OSU graduate desires to purchase or enter partnership agreement in small animal practice in Ohio or Indiana. Military obligation complete. Two years' experience in general practice. Address Box E 60, JOURNAL of the AVMA.

Want to purchase established, two-man, large-grossing, predominately or entirely small animal practice in Seattle or Washington-Oregon coastal area. Address Box E 59, JOURNAL of the AVMA.

For Sale or Lease—Practices

For sale—excellent mixed practice in southern Ontario, 50% small, 50% large, established four years. Gross—\$35,000, still growing. Price—\$35,000, includes new hospital, new ranch style home with four bedrooms and two baths, drugs and equipment, some real estate. \$10,000 to handle. Address Box E 61, JOURNAL of the AVMA.

For sale or lease—mixed practice, Middle Atlantic state, established 11 years, netting \$10,000. Beautiful new home, landscaped, on main highway, hospital with 20 cages, outside runs. Sell for price—real estate and equipment. Address Box E 58, JOURNAL of the AVMA.

For sale or lease—modern hospital and practice. Average gross for last 5 years—\$38,000. Real estate value—\$42,000. Open for offers. Address Box E 53, JOURNAL of the AVMA.

For sale—Penn Animal Hospital, formerly operated by the late Dr. Glenn, situated in center of

VETERINARY PHARMACOLOGIST

To head Veterinary Pharmacology Department for an ethical veterinary pharmaceutical house. Qualified applicant should be either Ph.D. Pharmacologist or D.V.M. with Pharmacology training. Position will afford professional growth and opportunity with expanding Research Staff. State qualifications, present position and salary. Address Box E 1, JOURNAL of the AVMA.



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Houston, Texas, small and large animal clinic for 3 to 5 year lease. Fully equipped—runs, cages, X-ray, surgery, laboratories. Located on main Southeast road. Address Box 45758, Houston 45, Texas.

LUCKY LUCY?



No! No rabbit's foot for her. She knows many cancers can be cured if found in time—so she gets a health checkup every year. She also knows contributions can help conquer cancer—so she gives generously to the American Cancer Society. Send your gift to "Cancer," in care of your local post office.



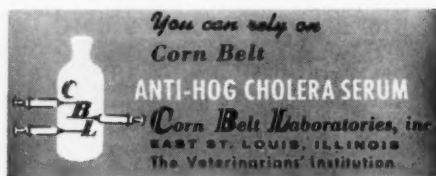
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Provides an accurate pattern against which to cut with knife or razor blade. Cannot move or slip when clamped into position. Made of non-rusting cast aluminum, highly polished. Simplicity of design and construction reduces possibility of breakage or mechanical failure. Forms immediately available for these breeds: Boxer, Boston Terrier, Great Dane, Doberman. \$15, postpaid. Set of these four—\$50, postpaid. Forms for other breeds made on special order. Sold to veterinarians only. Send check or money order.

2126 Forest Road

Lensing 10, Mich.

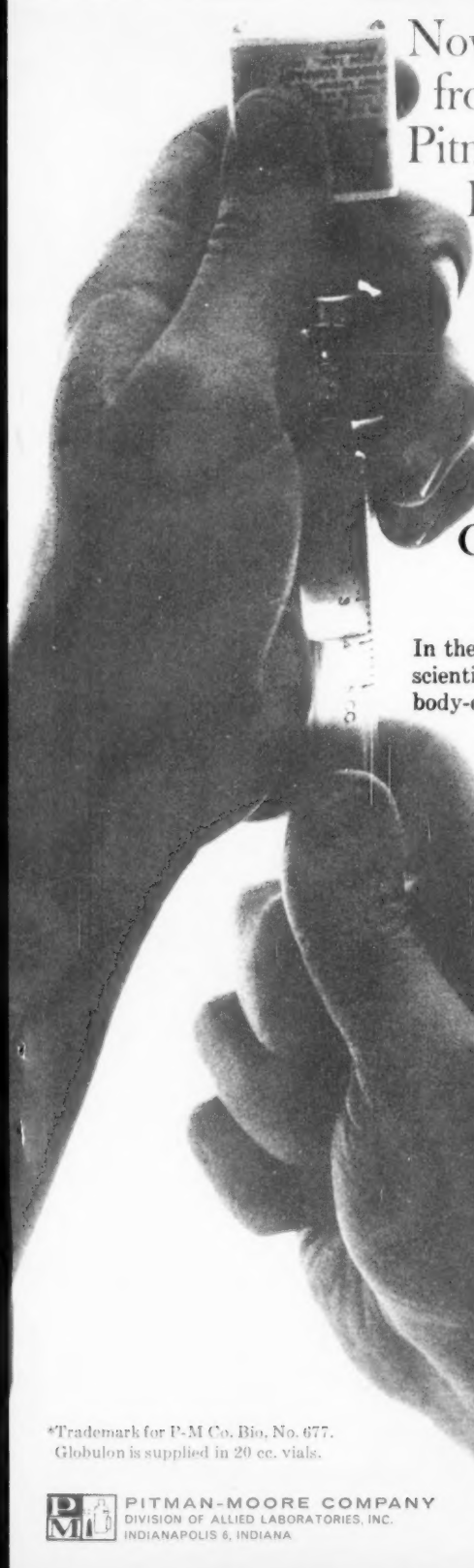
Eastern Nebraska practice for sale or lease, 90% large animal. Furnished house, office, drugs, equipment and instruments. Address Box C 18, JOURNAL of the AVMA.



For sale—Illinois general practice, established 20 years. Price \$25,000; includes house, garage, office, equipment, drugs, and office furniture. \$5,000 to handle. Address Box S 34, JOURNAL of the AVMA.

Wanted—epileptic dogs for research in anticonvulsant therapy. All handling expenses paid. Address Box E 8, JOURNAL of the AVMA.

Abbott Laboratories		Merck & Co.	
<i>In Kind solutions</i>	43	<i>Hydelhone T.B.A.</i>	11
Affiliated Laboratories		National Laboratories	
<i>Rabies vaccine</i>	13	<i>BSP</i>	49
American Cyanamid Co.		Norden Laboratories	
<i>Pigdoser</i>	31	<i>Leptospirosis vaccine</i>	1
American Optical Co.		Odell Company	
<i>Hb Meter</i>	28	<i>Clipper Care</i>	52
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<i>Antrate-H.C., Amotac-A, SWEB</i>	8	<i>Chloromycetin reprints</i>	35
<i>Caninal-S</i>	9	Parlam Corporation	
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Chicago Pharmacal Co.	69	Pfizer Laboratories	
<i>United</i>	29	<i>Liquamycin</i>	59-62
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<i>Anti-Hog Cholera serum</i>	70	Philadelphia Ampoule Laboratories	
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<i>Duratin</i>	2nd cover	Pitman-Moore Company	
Eaton Laboratories		<i>Whipcide</i>	33
<i>Furacin Water Mix</i>	7	<i>Globulon</i>	3rd cover
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<i>Furacin products</i>	32, 33	<i>Histacount</i>	54, 69
Fort Kennels	56	Reading Body Works, Inc.	
Fort Dodge Laboratories		<i>Vetro Body</i>	21
<i>N.L.V.</i>	5	Research Laboratories	
<i>Noldrat</i>	34	<i>D-Vac-H</i>	55
Friskies—Carnation Co.		Schering Corporation	
<i>Friskies Meal</i>	27	<i>Aziun</i>	17-20
Gaines—General Foods Corp.		Standard Brands	
<i>Gaines Meal</i>	63	<i>Hunt Club Burgerbits</i>	45
G.L.F.		Swift and Co.	
<i>Big Red</i>	56	Uniphon Company	58
Haver-Lockhart Laboratories	22-25	<i>Unipet</i>	47
Jensen-Salsbery Laboratories		Vitamineral Products Co.	
<i>Thionium Shampoo</i>	4th cover	<i>Ribald II, CON-O-Mineral</i>	26
Kasco—Corn Products Sales Co.		Warren-Teed Products Co.	
<i>Kasco Meal and Pellets</i>	16	<i>Thera-tergent</i>	41
Kirschner Manufacturing Co.		Wilson and Co., Inc.	53
<i>Animal cages</i>	6	<i>Ideal dog food</i>	43
MacAllan Laboratories		W.W. Manufacturing Co.	
<i>Ear-Cropping forms</i>	70	<i>Cattle chule</i>	51
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<i>Kerapray</i>	57	<i>Sparine</i>	62



Now...
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GLOBULON*

the most potent,
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of canine antibodies

In the development of Globulon, Pitman-Moore research scientists succeeded in separating and standardizing antibody-carrying globulins (both gamma and beta) from those fractions of canine serum that are immunologically inert.

As a result, the veterinarian now has a potent new weapon in dealing with bacterial and viral infections of dogs.

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***Unquestionably, the Most
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